



### OVERSEAS NEWS

## Papandreou warns US on bases

BY ANDRIANA IERODIACONOU IN ATHENS

Mr Andreas Papandreou, the Greek Socialist Prime Minister, has delivered a strong warning in advance of a March visit to Athens by Mr George Shultz, the US Secretary of State, that it is too early for Washington to press for an answer on the contentious issue of the future of the four US military bases in Greece.

The Socialist's official position is that they will close the bases in 1988, the first opportunity to do so under the terms of a five-year defence and economic co-operation agreement (DECA) signed with Washington in 1983. Mr Shultz is expected to probe the Papandreou Government on the possibility of an extension.

If the US is not prepared to wait, Mr Papandreou said in an interview with the Financial Times, its alternative is to renounce the 1983 agreement and risk throwing the bases issue open to new negotiations.

"A five year agreement exists, signed by both sides, which has not even run half its course. If the Americans are making an issue of it after only two years, that is a change of direction on their part," Mr Papandreou said.

"I have stressed to the Americans that if they don't like this agreement, let them



Papandreou—strong words

renounce it, and then new negotiations will have to begin. Our intention is to rid the country of foreign bases."

The US wants an early answer to enable it to plan a relocation of the bases if necessary. Turkey and Italy are considered likely alternative sites. The bases provide communications and anchorage support for the Sixth Fleet. They also

monitor Soviet activity in the Mediterranean and serve as launching pads for surveillance flights over the Middle East.

The Papandreou Government faces municipal elections next October. Before then any visible compromise with the US on the bases would be politically difficult. The next general election is in 1989, by which time the fate of the bases must be resolved.

Mr Papandreou said Greece might seek a European Community guarantee against a perceived Turkish threat to its borders, but said Athens believes that West Germany, which has close ties with Ankara, would be likely to block such a move.

A bid to secure a guarantee by the North Atlantic Treaty Organisation (Nato) against attack from a fellow Nato member, founded in the past as a result of a Turkish veto, Mr Papandreou said.

"The EEC could say that the borders of each member country are protected. The phrasing could be very general, without specific reference to Greece. Then the Turkish threat would be over."

"However, we feel the West Germans would reject it. They have the same relationship with Turkey as the US does. They

see it as the country which has replaced Iran."

Mr Papandreou indicated that his Government is determined to apply the economic stabilisation measures announced last October, aimed at reducing inflation and the current account and public sector deficits.

Additional steps would be needed if Greece is to enjoy "autonomous economic development, without direction from outside." Mr Papandreou was understood to be referring to the International Monetary Fund.

"The measures are tough, and people will realise just how tough over time. But measures are not enough. There has to be a new climate, Mr Papandreou said.

"Industrialists must invest to make our products more competitive, and workers must contribute. The Government has to concern itself with the public sector, which represents over 50 per cent of the national product. Productivity is particularly important there and that is our goal."

Mr Papandreou said he foresaw "no dramatic changes in the next few years" in the economy but rather "fundamental structural improvements."

Survey, Page 15-16

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## East-West spy swap forecast

BY PETER BRUCE IN BONN

THE BIGGEST spy swap between the East and West since the end of the Second World War could take place in Berlin soon, according to the West German newspaper, Bild.

This will include the release of Mr Anatoli Scharansky, a Soviet dissident accused by Moscow of spying for the US.

It is thought unlikely that the swap relates in any way to the apparent offer two days ago of Mr P. W. Botho, the South African President, to release Mr Nelson Mandela, the leading black nationalist, in return for the freedom of Mr Scharansky and another well-known Russian dissident as well as a captain in the South African army being held by the Angolans.

Bild, which is usually well informed and often used by the Soviets to leak information on dissidents to the West, today quotes "high Soviet sources" saying that Mr Scharansky will

be swapped for a number of communist agents being held in West Germany and the US in the next few days, probably at the Glienicke Bridge, a crossing point normally used only by the military.

Bild says the exchange, the result of "months of negotiation," has been pieced together by Mr Wolfgang Vogel, an East German lawyer and spy-broker.

By labelling Mr Scharansky, who is in jail in the Soviet Union, as a US spy, the Soviets have been able to include him in the proposed swap. Efforts by the West to secure the freedom of another important dissident, Mr Andrei Sacharov, at the same exchange appear to have failed, Bild says.

Rumours of a spy exchange have been circulating since the Soviet and US leaders met in Geneva in November. A modest exchange of captured agents, involving around five people, was carried out at the bridge on

December 4 largely, it is believed, to serve as a signal of good faith on both sides of a bigger swap.

Lestie Collett adds: An end to the stream of Third World asylum seekers entering West Germany through East Berlin's airport appears in sight following protracted negotiations between East Berlin and Bonn.

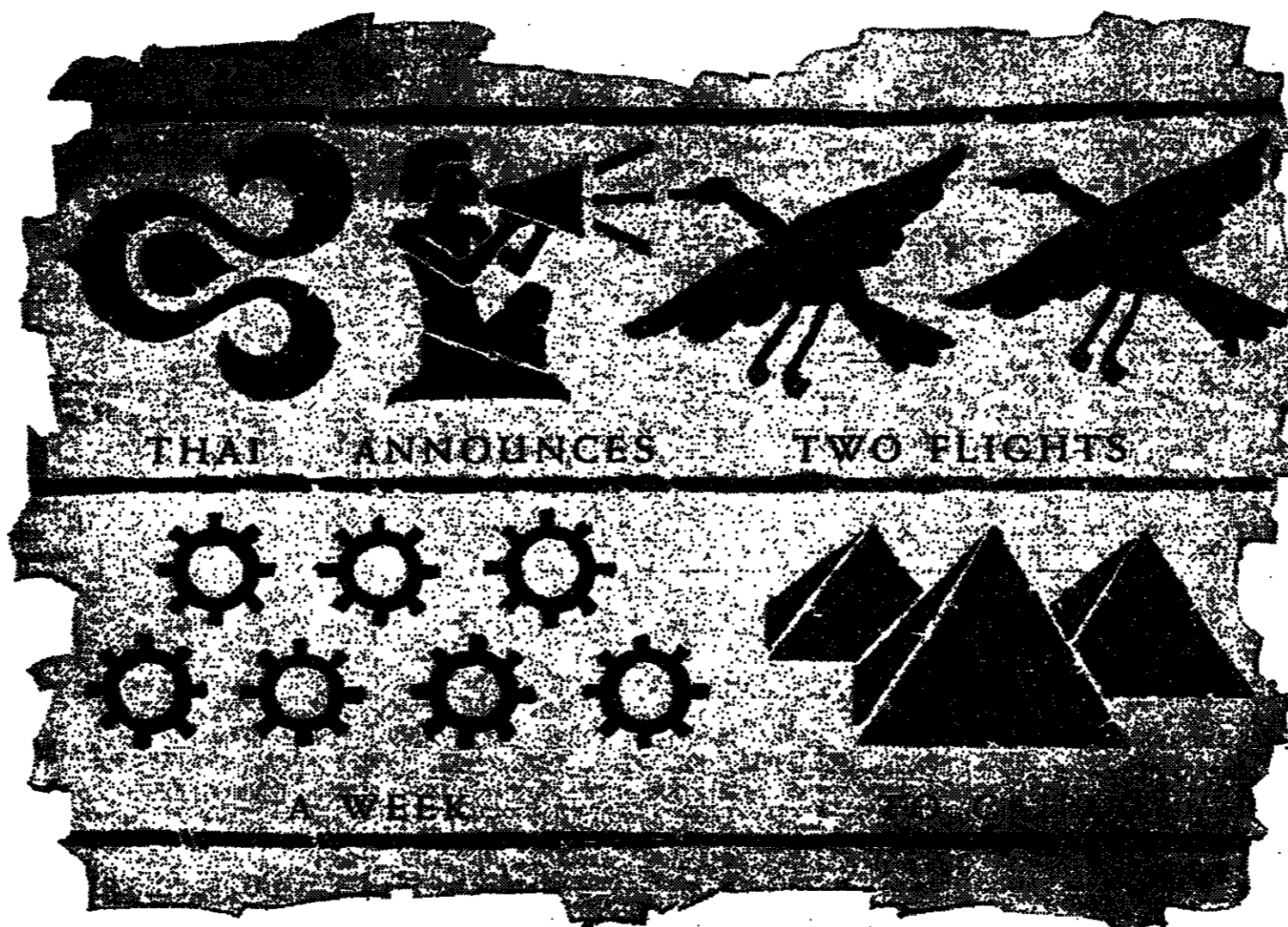
The East German news agency said at the weekend it would permit citizens from a "number of countries" to enter West Germany through East Germany only if they had West German visas.

Utilising West Germany's liberal asylum law, thousands of asylum seekers from Asia and Africa have poured into West Germany in recent months after landing at East Berlin airport. More than half of them crossed from East Berlin into West Berlin which warned it could no longer cope with the influx.

## Bonn denies Kohl charges

The West German Government yesterday labelled as a "campaign of slander" formal charges by the environmentalist Green Party that Chancellor Helmut Kohl made false statements to a parliamentary committee

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OVERSEAS NEWS

Nigeria to boost production of crude oil

BY PATTI WALDMER AND MICHAEL HOLMAN IN LAGOS

NIGERIA intends to boost its crude oil output to maximum levels as soon as possible in an attempt to counter the effect of low oil prices on the country's revenue, according to oil industry officials in Lagos.

The Nigerian National Petroleum Organisation (NNPC), the state oil company, is understood to set a production target for the first quarter of this year at around 1.5m-2m b/d (barrels a day) well above the country's nominal 1.5m b/d quota within the framework of Petroleum Exporting Countries (Opec).

Opec ministers meet today in Vienna to review the recent fall in oil prices, and consider whether to restrain output to reduce the market glut.

Nigeria, which is facing severe debt servicing problems over the next few years, is unlikely to agree to reduce its output. Industry officials say production could rise to around 1.5m b/d this month from an average of around 1.2m in January, but they stress that NNPC target of 1.5m-2m b/d for the quarter would be technically impossible to meet due to the very low levels of output earlier this year.

The target represents Nigeria's technical production capacity on a daily basis, but officials believe that output of no more than 1.5m-1.6m barrels could be sustained over long periods.

Company officials say it would be technically possible to reach

an average output of 1.5m barrels for the first quarter, although they are uncertain that buyers can be found for the additional quantities in the market.

Output is running at around 1.3m b/d, up from a low of 1m b/d early in January, prior to the conclusion of a new "incentive" agreement with oil companies producing in the country.

The agreement, which links Government taxes and royalties to the market price of crude rather than the artificially high official price, has been welcomed by most company executives. It allows companies to continue operating profitably even at the current low spot market prices and involves a commitment that companies will lift an agreed portion of NNPC equity.

Nigeria has been moving towards market related prices with third party customers. Late last year NNPC concluded a deal with the Banque Paribas to buy a 4.2% stake in the bank. The deal has extended a \$250m (£178m) oil-secured short term loan to Nigeria in return for crude oil on a net-back status (in which the crude price is determined by the eventual price of refined products).

About \$1.5bn in crude was to be lifted over 18 months under the deal, but it is understood that the terms of the agreement may be under renegotiation.

Peru rolls over unpaid foreign debt obligations

By Doreen Gillespie in Lima

THE Peruvian Government has rolled over unpaid obligations on its \$14bn (£10bn) foreign debt for a further three months. The move, announced over the weekend, was widely expected since the last rollover in August 1985 expired at the end of January.

Peru's unpaid principal and interest amounts to nearly \$2.2bn and this will be rolled over until May 2, according to a decree published in the official daily El Peruano. The decree also unilaterally set interest at 1.7 per cent above Libor for medium- and long-term public debt and at 2.25 per cent above Libor for commercial bank credits.

Peru has not paid any principal on medium- and long-term debt to private banks since March 1983. Since President Alan Garcia took office at the end of last July, the government has been limiting service of its medium- and long-term public sector debt of \$11bn to 10 per cent of export earnings.

Haitian President rides storm of protest

BY CANUTE JAMES IN PORT-AU-PRINCE

HAITI'S President-for-life, Mr Jean-Claude Duvalier, appears to have temporarily ridden the storm of anti-Government protests which threatened to unseat him last week. An uneasy calm has settled over Port au Prince, the capital, following the president's imposition of a state of siege on Friday. Armed soldiers and policemen have been patrolling the streets of the city and there has been sustained gunfire in the city over the last two days.

The President still faces widespread opposition outside the capital. Anti-Government protests were staged on Saturday in the cities of Gonaïves and Cap-Haïtien, both hotbeds of opposition to Mr Duvalier's dictatorship. Protesters continue to call for an end to the 28-year rule of the Duvalier family and appear to favour a take-over by the army. There are reports that several demonstrators have been killed over the past few days. At least 12 people have been killed since the anti-government protests began in

November following the shooting by the army of three schoolchildren in Gonaïves. In spite of claims that his presidency was "as firm as a monkey's tail" there is continuing uncertainty about Mr Duvalier's ability to hold on to power. The President has made seven public appearances to convince Haiti's 6m people that he is still in charge, but the credibility of his administration has been severely dented by the widespread and popular nature of the protests and by his need to resort to

the army to ensure the survival of the dictatorship. Diplomats in Port au Prince say that in spite of the relative calm of the past two days there is evidence of growing confidence within groups which oppose the president that he can be brought down at any time. "The people of Haiti now know that after nearly three decades they can successfully twist the tail of the Duvalier monkey," said one diplomat. "Unless he maintains martial law indefinitely he will be

under the threat of being overthrown by nothing more than massive demonstrations against his rule." Mr Duvalier took over the presidency in 1971 following the death of his father François "Papa Doc" Duvalier. Some analysts argue that Mr Duvalier has been emboldened by the embarrassing sequence of events on Friday when the Reagan Administration announced that he had been overthrown. The statement was later retracted by the State Department in Washington.

China tries to stamp out old family favourites

BY ROBERT THOMSON IN PEKING

THE GOVERNMENT of a society gripped by "guanxi" (connections) and where nepotism is a norm, has launched a crackdown against family favouritism that will strike at the very heart of the Chinese character.

The campaign, announced yesterday, complements tough moves against corruption in high places, with arrests of senior officials expected in the next few weeks. It also comes at a time when central government control has been tightened in most areas.

Communism may have changed China in many ways, but it has not removed the importance of guanxi, which helps smooth over problems in everything from buying a bicycle

to picking up a bottle of mao tai (a Chinese spirit) on the cheap.

China's paramount leader, Deng Xiaoping, unsighted in public for well over a month, has provided a formula for the anti-nepotism campaign, which is aimed particularly at high-ranking government and Communist Party officials: "Action, yes - empty talk, no."

Part of the action includes giving government workers and party members the right to nominate candidates for promotion in order to stop powerful parents plucking their offspring from lousy jobs and elevating them to prestige positions.

The Chinese news agency, Xin-

hua, said the move "is aimed at making the selection process more democratic, and preventing certain officials from promoting their own friends and relatives, regardless of competence." Candidates are supposed to be nominated by secret ballot, and "senior officials are not allowed to suggest who should be promoted: they must withdraw from a party committee meeting discussing promotion of their children or relatives."

During last year's spate of student protests, a common complaint was that the children of high officials are chosen for the most interesting and best paid jobs, despite poor exam results, and often win

scholarships for study overseas. To stop the Great Leap Forward through the ranks by well-connected employees, the government has stressed that "normally" officials must be promoted "grade by grade." However, there are special cases: "Those to be promoted more than one grade must have exceptional talent or be in urgent need."

One diplomat suggested the Government has no hope of nullifying nepotism, which is and always has been endemic: "It is a time-honoured system of preferential treatment. I don't think this is going to make a great deal of difference." This drive, and the anticorruption campaign, highlight the problems

Deng Xiaoping and his fellow pragmatists face with their reform program, and show they have decided to reassert central control. The economy is not developing as the reformers had hoped, and too many officials have taken advantage of the reforms to line their pockets. It is understood that several prominent media and arts administrators have recently been charged with offences such as procuring pornographic videos and fraud.

In an attempt to improve the image of the party and government, a series of widely-publicised austerity measures have been introduced for high cadres (officials).

Swiss banker attacks Baker debt initiative

BY JONATHAN CARR IN DAVOS

THE US-sponsored Baker Plan to ease the international debt crisis is so far "only an idea" and major issues must be resolved if it is to get off the ground, according to a top Swiss banker.

Mr Franz Lutolf, senior executive of the Swiss Bank Corporation, said the "burden between those involved in the scheme—debtor states, international organisations, Western governments and the banks—was not being distributed fairly.

He noted that under the initiative last October of Mr James Baker, the US Treasury Secretary, commercial banks were supposed to put up an extra \$20bn in credit over the next three years to help 15 particularly needy countries.

But of those 15 only one, the Ivory Coast, was so clearly putting its economic house in order as to qualify for the extra funds, Mr Lutolf said. A few other states including Ecuador and Uruguay were close to doing so.

The banks had already broken their key role of prudence—namely not to lend to borrowers needing credit to make interest payments on their loans—and now were being asked to do more. "Our shareholders keep asking if this is right," Mr Lutolf declared.

He was speaking on the sidelines of the Davos Symposium, an international business and economic conference, at which the inter-related issues of debt,

falling commodity prices and the Baker Plan have loomed large. Mr Lutolf underlined that he was not saying "no" to the Baker initiative. Indeed, the Swiss banks, along with those in many other Western countries, have already given their assent "in principle" to the scheme.

But he underlined with striking frankness the conditions he felt had to be fulfilled. They included: "Western governments had to pledge greater backing for the plan, for example by offering more export risk guarantees. So far there had been little sign they would do this and early talks were needed between them and the banks at national level."

"The extra funds could only be made available on a case-by-case basis. Those states receiving them should show they were following sound economic policies, were tackling the problem of capital flight and laying a better basis for foreign direct investment."

Mr Lutolf stressed that there must be no repeat of a situation like that of the "Mexican emergency" a few years ago, when the banks felt forced to put money quickly into a common pool to avert an international financial crisis.

"You cannot continue with that sort of action indefinitely," Mr Lutolf said. "We must face the problem properly and there will be no better time to do it than now."

Argentina backs call for meeting on debt crisis

BY JOEY BURNS IN BUENOS AIRES

SUPPORT IS growing among Latin American countries for fresh co-ordinated action to stave off a new payments crisis threatened by falling oil prices.

In a statement released by the Argentine Foreign Ministry on Saturday, President Raul Alfonsín issued his support for an urgent meeting of the Cartagena group of Latin American debtor nations, as urged by Mexican President Miguel de la Madrid and his Venezuelan counterpart, Mr Jaime Lusinchi, at the end of their two-day summit last week.

The Argentine statement is understood to have been issued after close consultation between Mr Alfonsín and President José Sarney of Brazil in the latest evidence of a hitherto unsuspected degree of co-ordination among the region's four major debtors—publicly confirmed for the first time at the meeting of the Cartagena group in Montevideo in December.

At that meeting the group presented a bold package of alternative proposals to the Baker Plan, which was classified as a step in the right direction but insufficient to solve the region's debt problems.

The proposals, which included a call for additional funds from commercial banks and an end to conditionality on multilateral lending, have so far failed to stimulate a firm response from industrialised nations.

Some observers in Buenos Aires believe that in the light of the cash problems provoked by the fall in oil prices and, in the case of Argentina, grain prices, major debtors may be moving towards more radical proposals.

Mr Alfonsín's weekend statement was delivered in a measured and undramatic tone with little suggestion of a threat.

However, it coincides with official Argentine confirmation that the country's negotiations with the International Monetary Fund on reviving a temporary suspended standby agreement remain deadlocked. In a front-page interview published yesterday by the pro-Government La Nación, one of the country's chief debt negotiators, Mr José Luis Machuga, said the two sides had failed to agree on a revised fiscal and balance of payments targets for the first quarter of 1986.

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OVERSEAS NEWS

# South Yemen to stand by foreign contracts

**BY TONY WALKER IN ADEN**

**SOUTH YEMEN'S** interim President, Mr Haider Abubaker al Attas, says his country will insist that foreign companies fulfil the terms of their contracts.

Mr al Attas, who was installed as temporary head of state after former President Ali Nasser Mohammad was ousted in a bloody conflict between rival factions in this pro-Soviet state, said South Yemen would stand by all its agreements with foreign contractors.

"We expect that those foreign companies will be coming back once stability is restored in order to implement and carry out projects which we agreed," he said.

"We will respect all of the contracts we signed with foreign companies. We hope and expect those foreign companies will do the same."

A number of British companies are involved in infrastructure projects in South Yemen, some of which are funded by the World Bank. Several hundred British and American families were evacuated from South Yemen to escape the heavy fighting that caused widespread destruction.

emptive coup attempt against his rivals.

Among companies involved is Bovis Engineering. South Yemen has in recent years entered into a number of agreements to improve water supply and sewage facilities in its major towns. British companies have won a lion's share of these contracts.

Mr al Attas, who as Prime Minister was visiting New Delhi when the fighting broke out, is appealing for assistance in South Yemen's reconstruction efforts.

"We really need help, especially from international and regional organisations," he said.

Pro-Marxist South Yemen is mainly reliant on the East Bloc, particularly the Soviet Union, for aid. It receives relatively little assistance from the West.

Moscow has already begun sending humanitarian aid, including foodstuffs and medical supplies.

A large number of Soviet technical advisers and their families were evacuated from South Yemen to escape the heavy fighting that caused widespread destruction.

# Libya offers higher wages to keep Americans

**LIBYA** is offering higher salaries to lure back Americans ordered out of the country by the US Government, diplomatic sources said yesterday. Reuter reports from Tripoli.

US oilmen were already earning up to \$100,000 a year before President Reagan imposed an economic boycott on Libya, accusing Colonel Muammar Gaddafi of sponsoring terrorism. The sources said Libyan companies were holding jobs open for American employees who felt obliged to leave the country and were trying to tempt them back with more money.

Western diplomats said there was no mass exodus by President Reagan's deadline of February 1 and it was not known how many of the estimated 1,000 to 1,500 Americans in Libya decided to stay on.

A US Senate Department spokesman said on Saturday at least half the Americans had left.

President Reagan ordered all Americans to leave Libya when he announced economic sanctions on January 7. He also banned Americans from travelling to Libya or doing business with it.

# John Elliott reports on the Pontiff's controversial visit to India Pope aims to bridge religious gap

**AN AFTERNOON** of Christian singing and dancing with speeches from leading Hindu, Muslim and Sikh personalities yesterday marked a relatively quiet start to a 10-day tour of India by Pope John Paul II.

The event, watched by about 20,000 people, reflected the theme of unity with which the Pope is trying to bridge the gap between India's 12m Catholics and 650m Hindus.

Shortly after the Pope arrived in Delhi on Saturday more than 400 demonstrators were arrested for a few hours when they tried to block a road along his route. A 12ft-high photograph of the Pontiff was daubed with paint near Delhi's Catholic cathedral.

His effigy was burned by a group led by Mr Gopal Gode, a brother of the man who in 1948 assassinated Mahatma Gandhi, the Indian independence leader.

The group, the Akhil Bharatiya Hindu Mahasabha, draws a parallel between Mahatma Gandhi, who they condemn for allowing Muslims to partition Pakistan into a separate country in 1947, and a separatist threat they believe is caused in parts of India by Catholic and other Christian conversions.

One of the most emotional moments of the weekend came when the Pope knelt for almost five minutes at the cremation memorial of Mahatma Gandhi,



New Delhi poster attacking the Pope's visit

at Raj Ghat beneath the walls of India's old Moghul city, resting one hand on the black marble of the shrine.

The Pope described Gandhi as "not just an Indian leader but a hero of humanity" and a "voice of harmony striving for peace" whose light was shining still. A Vatican aide said he had never heard the Pope "use such words" about anyone before.

The visit has so far aroused

little public interest. About 20 per cent of Delhi's 400,000 Catholics have attended two masses and yesterday afternoon's festival, all held in Delhi's indoor Indira Gandhi stadium.

The tour which includes Ranchi in Bihar, one of India's poorest states, tight security precautions have been taken other than those held at yesterday's demonstration. A few dozen extremists were arrested.

Yesterday security was reinforced round the Indira Gandhi stadium after a Catholic from the southern state of Kerala, who had come to Delhi for mental treatment, threw a firecracker from a balcony as the Pope was leaving.

The Pope met the Dalai Lama, exiled leader of Tibetan Buddhism, at the Vatican embassy yesterday morning. Dressed in white, the Pope embraced the red-robed Dalai Lama.

Shortly after arriving on Saturday and kissing the soil at Delhi airport, the Pope met for 30 minutes with Mr Rajiv Gandhi, premier, and his wife Sonia, an Italian-born Catholic.

Mr Gandhi, whose father was a Parsee and mother and grandfather Hindus, has said that he, his wife and children are not a practising religious family.

# New Delhi cancels Jayewardene peace talks

**By Mervyn de Silva in Colombo**

**INDIA HAS** cancelled a visit to Colombo by the Indian Foreign Secretary, who was due to hold crucial talks with President Jayewardene on the island's ethnic conflict.

The move is seen in Sri Lanka as a sign of the growing influence of Prime Minister Rajiv Gandhi, with the lack of progress towards a settlement.

Mr Gandhi has been attempting to mediate between Tamil separatists and the Sri Lankan government.

Mr Romesh Bhandari was expected in Colombo this morning for two days of talks with government leaders on the latest proposals on regional autonomy submitted to Mr Gandhi by TULF, the main Tamil political party.

Over the weekend Mr Bhandari held talks with Madras-based Sri Lankan Tamil leaders from TULF and INLF, the umbrella Tamil guerrilla organisation of Sri Lanka's separatists.

The Tamil proposals were made known in December, but Sri Lanka's first written response came in a letter to Mr Gandhi from President Jayewardene on Thursday.

The instantaneous cancellation of Mr Bhandari's visit indicates a hardening of the Indian stance. The question is whether Mr Gandhi will give up the peace progress altogether. That would make things even more hopeless than they now are," a Western ambassador said.

# Pravda attacks former official under Brezhnev

**By Patrick Cockburn in Moscow**

**THE Soviet Communist Party** daily Pravda has launched the heaviest attack yet made on a senior Soviet official who flourished during President Brezhnev's 15-year rule.

The criticism is of Mr Sharaf Rashidov, who died in 1982 after 24 years as leader of Uzbekistan, with a population of 16m the third-largest of the Soviet republics.

Pravda blames him for shielding "serious state criminals" and allowing embezzlement, bribery and the falsification of statistics.

There was an extensive purge of the Communist Party of Uzbekistan in 1984. Immediately after Mr Rashidov's death, but there have been continued complaints in the press that this was not thorough enough.

Many of these removed have re-emerged in other jobs. Pravda said yesterday that 300 party officials have been fired, many of whom had obtained their jobs through family connections.

The attack on Mr Rashidov is the first time that such a senior political figure has been accused of criminal offences since the present purge of the party and state apparatus was started by President Yuri Andropov which year the inflation rate ran at 15 per cent.

The effect of the devaluation on managerial decisions, will be limited as some two-thirds of Polish sales abroad are centrally planned, and controlled.

# US postpones plans to sell arms to Jordan

**THE REAGAN** Administration has indefinitely postponed plans to sell Jordan up to \$1.9bn (£1.35bn) worth of advanced military equipment, more than the conventional arms deal voted down by Congress, writes Reginald Dale in Washington.

The move was seen as a considerable disappointment by Mr George Shultz, the Secretary of State, who had hoped the deal would encourage King Hussein in his toruous approach to the Middle East peace negotiating table.

Under earlier arrangements on Capitol Hill, the deal would have gone through on March 1 unless Congress voted to block it. By last week, however, it was clear that Congressional opposition was overwhelming and the two houses were threatening to reject the deal this week.

Congress has stipulated that the deal cannot be approved until King Hussein has entered "direct and meaningful" negotiations with Israel. Last week the State Department was unable to persuade Congressional leaders that such a breakthrough was likely.

# Women shot in S. Africa riots

**SOUTH AFRICAN** police shot a black woman in Mookeng township in a mining district 25 miles west of Johannesburg, where tensions have been high since the beginning of the year.

More than 12 people, including two white policemen, have died in recent unrest in the West Rand district. AP reports from Johannesburg.

On Saturday, police arrested two black men, one of them a prominent anti-apartheid campaigner, after a funeral for a black man killed in rioting in Munsieville township in the West Rand.

In Mamelodi, outside Pretoria, police shot another black woman in a crowd stoning a riot patrol, police headquarters said. A black man also was fatally wounded in a similar clash in Brayton, in eastern Transvaal province.

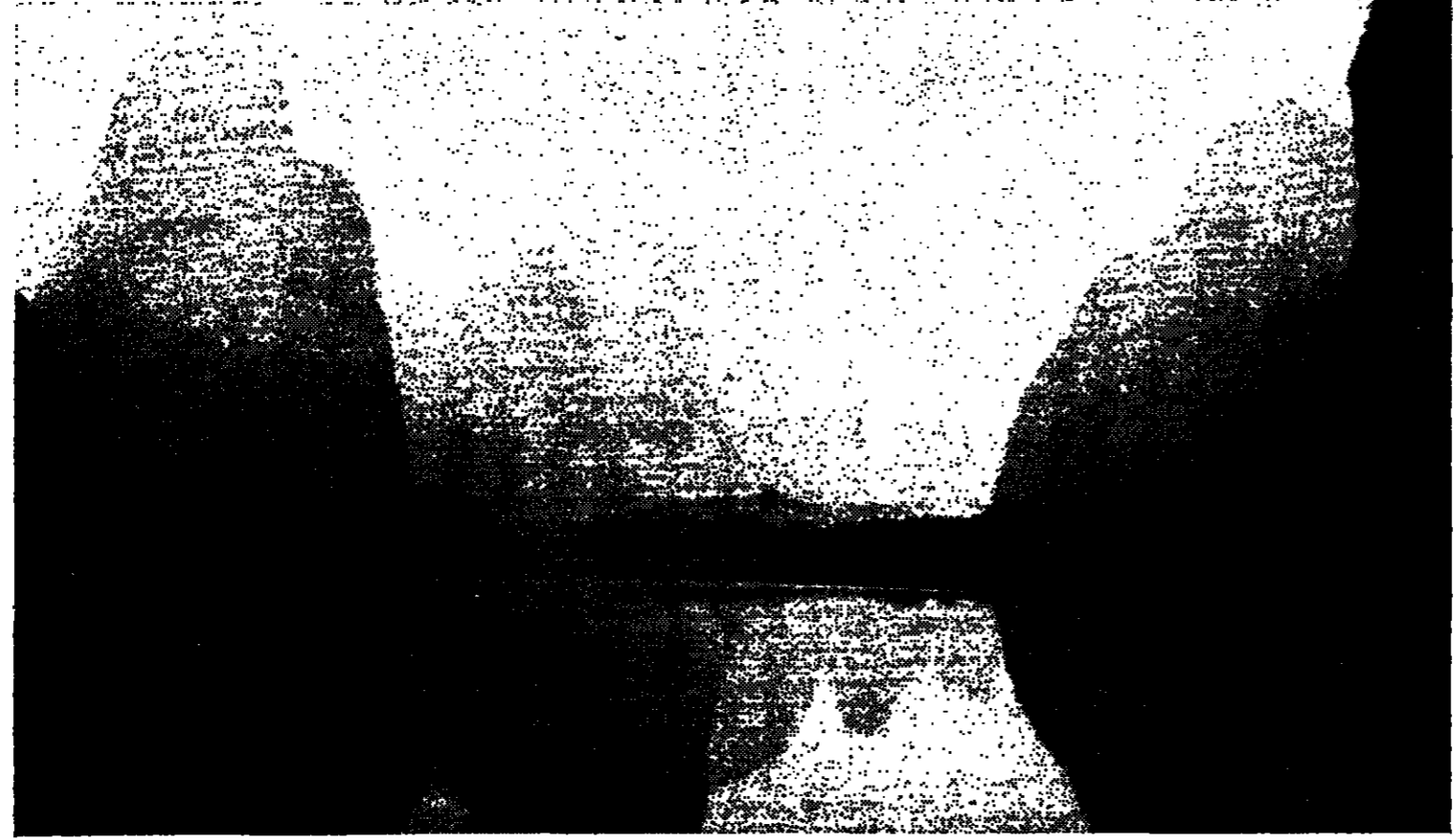
# Poland devalues zloty by 15.6%

**By Christopher Bobinski in Warsaw**

Poland devalued the zloty at the weekend by 15.6 per cent against the US dollar and other Western currencies in a bid to boost hard currency export earnings which are crucial to servicing repayment of the country's \$28.2bn (£21bn) debt.

The zloty—now standing at 170 to the dollar, was last devalued in June. Its value has fallen by 23 per cent since the beginning of 1985, during

# Sanwa's lead in China can do a lot for your business



**Old ties, new developments**

The Sanwa Bank, one of Japan's top financial institutions, has ties with China reaching back half a century. As a result of these long-standing relations, Sanwa became a major partner in 1984 in China Universal Leasing Co., Ltd. (CULC)—the first undertaking of its kind with Chinese and foreign

bank participation. CULC plays a prominent role today in assisting companies in China and promoting the country's economic development.

**A more extensive network**

To serve businesses throughout China, a far-ranging network is essential. Sanwa's activities in the country are supported

not only by CULC, but by offices in Beijing, Dalian, Shanghai, Shenzhen, and Guangzhou, and by one of the strongest banking bases in Hong Kong.

**The world's 7th largest bank**

Forward-looking banking made Sanwa what it is today: the world's 7th largest bank\*, with total assets of over

US\$109 billion and a vast global network. And all over the world, Sanwa bankers now offer more services than ever to support the expansion of business with China. For the financing experience and special know-how that your international activities require, just ask your Sanwa banker. And see what Sanwa's lead in China can do for your business.

Sanwa bankers are working for you everywhere.



# Sudan central bank moves to stem currency slide

**BY JOHN MURRAY BROWN IN KHARTOUM**

**SUDAN'S** central bank has announced new exchange control regulations in an effort to stem the slide of the Sudanese pound on the free market.

The pound, which is officially valued at 25 to the dollar, was last week trading at five to the dollar on the free market.

Pressure on the pound eased slightly following the announcement.

Hitherto the free market has been the main source of hard currency for the private sector. From yesterday, all foreign currency is to be pooled with the central bank and import licences will be determined by a committee of government and commercial bank officials.

This will limit the number of private sector importers and make more funds available for the public sector.

One commercial banker said he expected overseas suppliers to insist on 100 per cent cash collateral from any prospective Sudanese importer.

In the next few weeks commercial banks are likely to adjust the commercial rate of the pound, which stands at 3.3 to the dollar for non-government imports, in an attempt to attract remittances from Sudanese working abroad, which currently come through the free market.

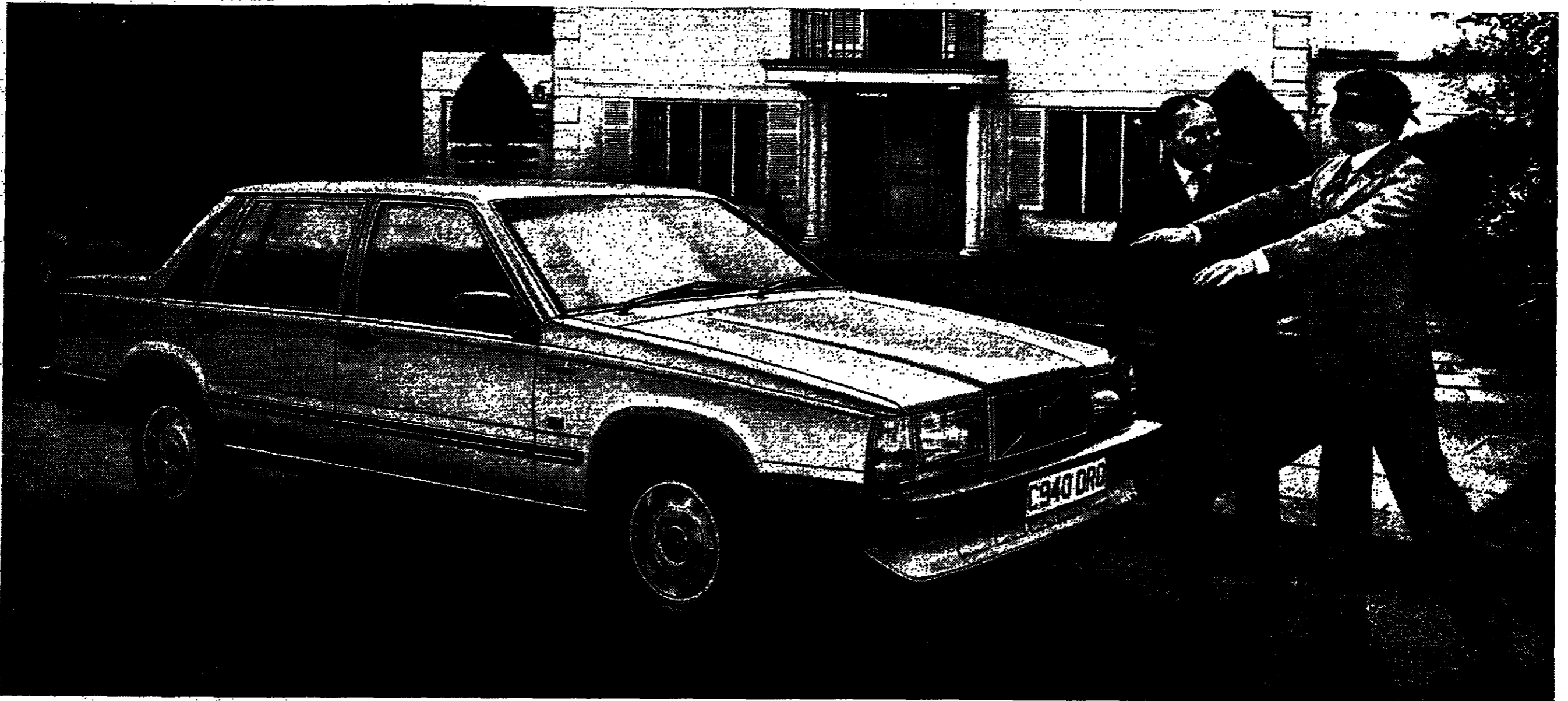
Remittances last year totalled more than \$500m. Given a more realistic rate for the pound, Sudanese officials said remittances could exceed \$1bn.

The announcement comes at a time when Sudan's transitional government is bidding to win a reprieve from the threat of suspension of Sudan's membership of the International Monetary Fund (IMF).

**Kleinwort Benson**  
 With effect from 1st February 1986  
 the Kleinwort, Benson Limited  
 mortgage rate will be 14% per annum.

\*1984 Institutional Investor Survey

# IF YOU COULD TEST-DRIVE IT BLINDFOLD, WOULD YOU GUESS WHAT CAR IT WAS?



We wouldn't recommend this experiment for real, but it's an interesting hypothesis nevertheless.

Imagine it.

The salesman guides you into the driver's seat. It feels reassuringly firm, yet so comfortable it could have been made specially for you.

(In fact, it has an adjustable lumbar support and a 16-position height and rake adjustment.)

The door closes with an effortless clunk.

**"IT'S A MERCEDES?"**

Good guess, but the wrong one.

Somehow, you can sense the spaciousness inside the car.

Your hands fall naturally onto the steering wheel, and your feet onto the pedals.

You switch on the ignition.

The engine fires instantaneously, dying to a barely audible purr.

**"A DAIMLER, PERHAPS?"**

Perhaps, yes. But actually, no.

As you pull away from the kerb (don't worry, the salesman gives you directions) you notice the lightness and precision of the power steering.

You accelerate briskly through the gears, enjoying the smooth power of the engine.

This car is no slouch.

**"IT'S ONE OF THOSE BIG BMW'S?"**

No it isn't.

The salesman, feeling rather pleased with himself, helps you with a few clues.

He tells you about the car's welded box-steel

construction, and the 9 coats of paint and primer that protect the bodywork.

He mentions the 13-outlet heating and ventilation system, the 17.2 cubic foot boot, the central locking.

You can feel the power-assisted brakes for yourself.

**"A JAGUAR?"**

Wrong again.

Against your better judgement, you start to lower your sights a bit. You did, after all, mention a price limit of £11,000.

But what car of that sort of price could give you this sort of ride?

Unable to contain your curiosity any longer, you pull into the kerb and pull off the blindfold.

**"A VOLVO! I KNEW I COULDN'T AFFORD IT!"**

Yes, it's a Volvo. The 740 GL, to be precise. And yes, you can afford it.

Amazingly, the car you thought could have been a Mercedes costs only £10,271.

You turn to the salesman sitting beside you. In one hand, he has an order form

for a brand new Volvo 740GL. In the other, a pen. Despite his presumptuousness, you sign.

To: Volvo, Springfield House, Princess Street, Bristol BS3 4EF.  
 For a brochure, phone (0272) 217082 or post the coupon.  
 Mr/Mrs/Miss \_\_\_\_\_  
 Address \_\_\_\_\_  
 \_\_\_\_\_ Postcode \_\_\_\_\_

**THE 1986 VOLVO 740. FROM £10,271.**

THE 1986 VOLVO 740 RANGE STARTS AT £10,271. 2.3 LITRE ENGINE, CARBURETTOR AND INJECTED VERSIONS AVAILABLE. PRICES INCLUDE CAR TAX AND VAT (DELIVERY AND NUMBER PLATES EXTRA). CORRECT AT TIME OF GOING TO PRESS. CUSTOMER INFORMATION TEL: IPSWICH (0473) 715131.

WORLD TRADE NEWS

Peking plans to double intake of foreign capital

BY JONATHAN CARR IN BONN

CHINA PLANS to double its intake of foreign capital to more than \$20bn (\$16bn) in the current five year plan period (1986-1990) to help finance its economic development, according to Mr Zhu Yongji, Vice Chairman of China's State Economic Commission.

In an address to senior executives in Peking, Mr Zhu said that in the last five years China had used just over \$10bn of foreign capital, most of it long-term low interest loans from the World Bank and similar agencies.

In the next five years China would boost its use of foreign capital, including the use of commercial loans. He said it was impossible to give an exact figure, but the intake would be at least double.

Foreign loans obtained on preferential terms would be used mainly to finance infrastructure projects in energy, transport and communications. Commercial loans could be used to boost the performance of companies which were already doing well and could earn foreign currency.

Mr Zhu was speaking at the annual symposium of EMEF, an independent Geneva-based organization, attended by more than 600 senior politicians and businessmen from over 50 countries. The Chinese traditionally use this forum to review their economic performance and outlook.

By 1990 China planned to increase the total volume of its exports and imports by up to 50 per cent over the 1985 level, with special emphasis going to the acquisition of advanced technology. Mr Zhu said China needed high technology imports to improve its quality control and experimental facilities, as well as to modernise sectors including machine building, electronics, textiles, packaging, chemicals and building materials.

He also stressed that China wanted to strengthen co-operation with foreign small and medium size business firms with the big companies. This was a key aim of his trip to West Germany, which would follow immediately on his visit to Bonn.

Mr Zhu agreed there had been some difficulties in negotiating deals under China's increasingly de-centralised economic structure. But China had only been open to the world for a few years, and much still needed doing to reform the economy—and above all the management systems. For all the difficulties "unprecedented opportunities" awaited foreign businessmen under the new five-year plan, he said.

CoCom speeds up China sales

BY DAVID BUCHAN

BRITAIN has announced a new system that will make the licensing of certain high-technology exports to China simpler and swifter than to other Communist countries. Similar announcements are expected to be made by Britain's Western allies very soon.

Details of the new procedures were published by the UK Department of Trade and Industry (DTI) on Friday. It allows Britain and its 15 partner countries in favour of a coordinating Committee (CoCom), which sets tightly sensitive technology sales to Communist countries, to grant licences on a wider range of exports to China at their own national discretion. Henceforth, licences to sell

the Chinese certain types of machine tools, semi-conductor and optical fibre equipment, industrial robots, computers, telephone exchanges, and other goods will not have to get prior unambiguous approval of CoCom.

The announcement is the culmination of moves by the West in recent years to erode China over the Soviet bloc in the administration of CoCom controls. But in practice, CoCom has made far more "exceptions" to its controls in favour of a China, considered increasingly friendly to the West.

Processing these "exceptions" has created a long backlog in CoCom, where the number of licence applications rose from less than 5,000 in 1983 to some 5,000 last year, most of them

concerning sales to China. Many of these applications can now be dealt with by national governments, without reference to the Paris organisation.

The DTI hopes that licensing will now be "significantly" speeded up, and that this will help boost further British exports to China. These increased to \$267m in the first 11 months of last year compared to \$258m in the third quarter.

The degree of Western competition which Britain faces in the Chinese market will not change, however, because all CoCom members — Nato countries plus Japan — are expected to announce and publish a similar relaxation in their licensing procedures for China by the middle of this month.

Exchange shortage fears grow

By Robert Thomson in Peking

CHINESE officials now admit the country's shortage of foreign exchange will not be overcome in the near future, in spite of statements late last year that a slump in foreign exchange reserves was under control.

A senior official of the state administration of exchange control was reported in the China Daily as saying China's "limited" amount of foreign exchange will only be spent on projects that are essential for the country's economic development.

The "key" to China's seventh five-year economic plan, beginning this year, is according to the Government, to earn enough foreign exchange to bankroll the importation of advanced technology and equipment.

Yet the Government has had great difficulty in increasing export earnings, and diplomats believe there is a serious concern about the level of foreign exchange reserves, a concern that will strictly limit foreign contract signings this year.

These reserves fell by \$50n from \$18.5bn in the six months from October 1984, and by the end of June last year were down to \$10.95bn. That figure was delayed for several months, and a senior People's Bank of China official said the third quarter figures showed an increase to \$11.5bn, and Mr Chen Muhua, head of the People's Bank, said: "The downward trend of foreign exchange reserves has been basically brought under control". The end of 1985 figure has yet to be released, and diplomats are watching for any seemingly inexplicable fluctuations.

GM and Man in joint truck venture

BY JOHN DAVIES IN FRANKFURT

THE WEST GERMAN truck maker Man and General Motors of the US are to work together on a plan to build military trucks aimed at the needs of the US armed forces in West Germany.

The co-operation agreement is one of a number of steps taken by GM to widen its involvement in Europe. It comes more than a year after initial discussions about a "close" tie-up between GM and Man in West Germany.

The two groups will collaborate in drawing up a joint plan for manufacturing and marketing heavy-duty trucks for use on both rough terrain and roadways and designed to meet US military requirements. Man said its "technical concept" would be the basis of

the co-operation project and each group would contribute what it was best able to do.

The companies are interested in securing orders to supply the armed forces in West Germany from units based in Europe. Man said it was too early to indicate where or when the trucks might be built.

GM will be involved through its military vehicles operation (MVO) unit based in Warren, Michigan. The MVO unit, formed in mid-1984, is active in engine technology and electronics as well as development of complete vehicles.

Man was general contractor for the development and manufacture of a new generation of military vehicles for the West German Bundeswehr. It has delivered more than 10,000 of them in the last few years. The

US Army has also taken delivery of more than 500 Man vehicles of this type since 1984 for use in the US and Europe.

Man has been seeking a recovery after running into problems a few years ago as a result of the setback in world truck markets. It has cut its workforce, streamlined production and lowered its break-even point in terms of output.

The agreement with GM comes a year after Man agreed to co-operate with Eaton of the US in developing and making axles for heavy trucks and buses.

GM, which sees potential in the heavy truck business, is believed to be considering buying Leyland Vehicles, the truck and bus operator of the state-owned BL group in the UK.

Yentter warns of EEC trade row

A super-strong fibre used for making bullet-proof vests could become a contentious trade issue between the US and the European Community, a US official said yesterday. Yentter reports from the Hague.

Mr Clayton Yentter, US Trade Representative said Washington would fight back if the Dutch government persisted in backing the chemical company Akzo in a battle with its US rival Dupont de Nemours Co. Both claim patent rights over the process for manufacturing an aramide fibre which is stronger than steel and much lighter.

Textile imports up

The American Textile Manufacturers Institute (ATMI) says textile and apparel imports are entering the US market at a record-breaking rate that totals \$2.1 bn in 1985. ATMI reports from Washington.

Seat tops car sales

Spain's state-owned automobile company, Seat, which is due to be acquired by Volkswagen, was the country's top car manufacturer in 1985—a year when the Spanish car industry as a whole grew by 4.5 per cent to establish a new production record of 1.2m units. Tena Barras reports from Madrid.

Sharp decline in Gulf tanker rates

By Andrew Fisher, Shipping Correspondent

IT WAS a dismal week for the shipping industry, with tanker rates falling sharply in the Gulf, grain rates continuing their slide, and one of Hong Kong's best-known shipowners turning to the banks for rescue.

Unsettled oil markets, as the price debate continued, led to a virtual drying up of inquiry for VLCCs (very large crude carriers) in the Gulf. E. A. Gibson Shippers of London said rates for VLCCs totalling 8.5m deadweight tonnes were sitting there waiting for cargoes.

It said a further 20 vessels of 5m dwt were expected to arrive in February, a level not seen for some time. "With such a build-up of available tonnage, owners are under extreme pressure."

Rate levels as low as World-scale 21 have been accepted for voyages to Taiwan, with little prospect of any immediate rise in rates from the Gulf in the market's present state.

More business was transacted from the North Sea, where output has been maintained. Oil companies and traders have fixed vessels from 65,000 dwt to the US up to VLCCs for Japan, with the 80,000 dwt size preferred for voyages around the European coast.

Dry cargo shipowners had "a thoroughly generalising week," according to Dunhelm Coates, the London shipbroker. A continuing surplus of tonnage is apparent in all areas.

The grain rate from the US Gulf to Continental Europe fell sharply from \$8 to \$6.75 a ton, while the rate to Japan was down from \$12.50 to \$12. Falling oil prices should benefit the industry through lowering fuel costs, but the effects have yet to show through fully.

In Hong Kong, the problems of Wah Kwong, the prominent bulk carrier operator, came as a further reminder that the shipping sector remains firmly sunk in depression. Earlier collapses of companies around the world, with which Wah Kwong had trading links, finally proved too much for it to bear.

World Economic Indicators

Table with columns: FOREIGN EXCHANGE RESERVES (US\$m), U.S., W. Germany, Japan, Belgium, Netherlands, France. Rows: Nov. 85, Oct. 85, Sept. 85, Nov. 84, Oct. 84, Sept. 84, Aug. 84, Oct. 83.

BUSINESS TALKS ON FOREIGN TRADE Economic and Technical Co-operation, Jiangsu Province, China (March 1st to 12th, 1986, Nanjing, Jiangsu Province) Organizer: The Commission of Foreign Economic Relations and Trade, Jiangsu Province, China. Participants: China National Textiles Imp. and Exp. Corp. Jiangsu Branch, etc.

Banco di Sicilia INTERNATIONAL HEAD OFFICE: ROME BRANCHES ABROAD London Frankfurt a/M Paris New York Los Angeles REPRESENTATIVE OFFICES Brussels Budapest Chicago Munich Singapore Zurich

NOTICE TO DEBENTUREHOLDERS K MART (AUSTRALIA) FINANCE LIMITED 9% Debentures RoyWest Trust Corporation (Cayman) Limited, the Stock Trustee of the Arana Hills Properties Stock Trust, has arranged for the preparation of an Information Booklet in order to furnish certain important information concerning the Debentures and the properties purchased and/or constructed with the proceeds from the sale thereof.

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February 3 1988

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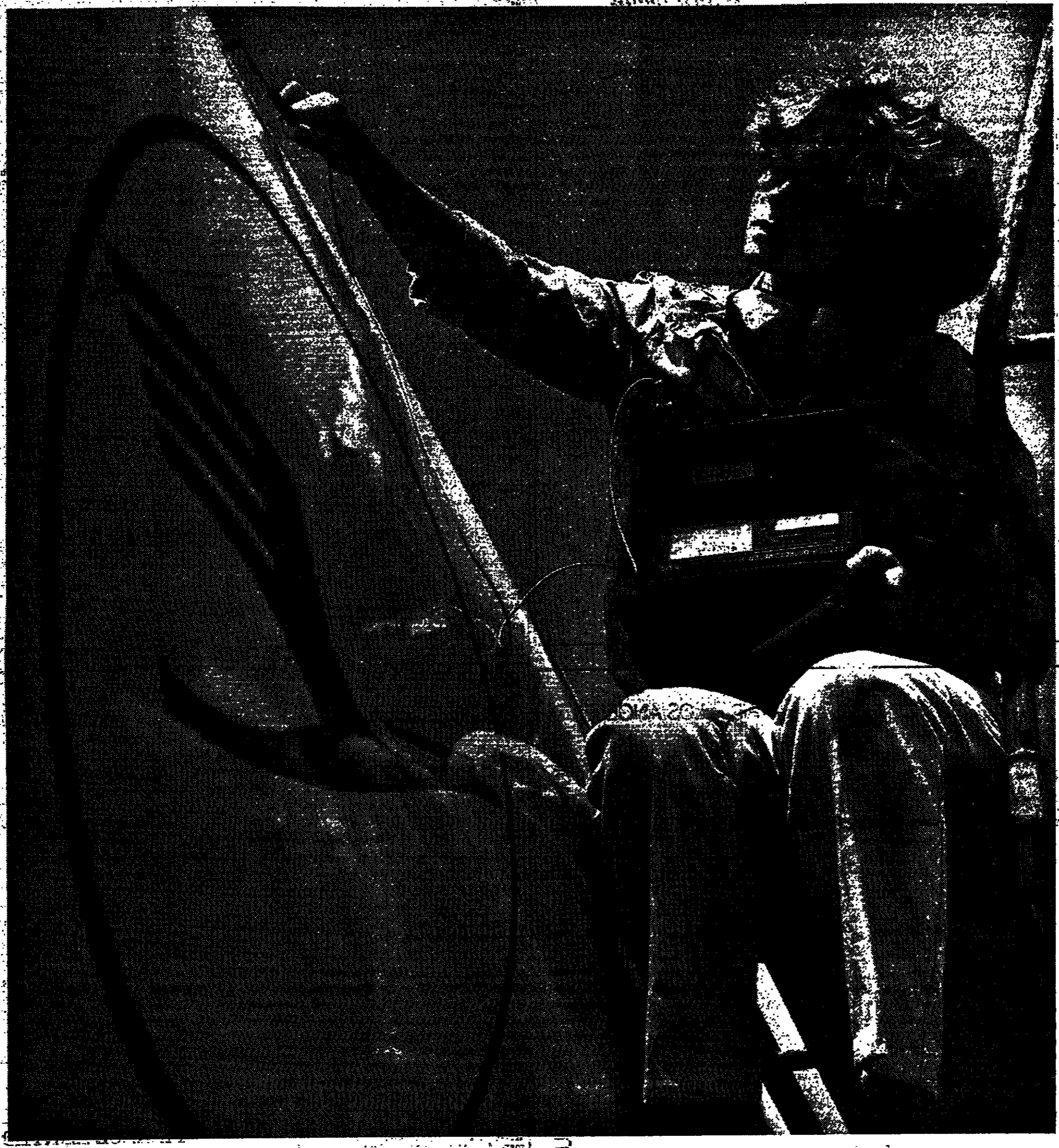
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# If you think we're picky, hard-to-please perfectionists - you're right.



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DOMESTIC FLIGHTS - 17 HOURS

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UK NEWS

Thatcher faces revolt over EEC budget

BY JOHN HUNT

MRS MARGARET THATCHER, the Prime Minister, faces a difficult time at Westminster this week with continued pressure over the Westland affair and the row over whether officials from No 10, Downing Street, should appear before the House of Commons defence committee to answer questions. In addition, she faces a rebellion of Tory backbenchers tonight over the decision to approve an £18m payment towards the EEC budget. Anti-EEC Tories are angry that this first quarter's payment is being made, even though the Government and other member states have said that the budget is illegal. About 30 of them are expected to abstain or vote against the Government. There are continued rumblings on the Conservative backbenches against Mrs Thatcher's style of leadership. Sir Anthony Meyer, a Conservative MP for Wales, yesterday renewed his call for Mrs Thatcher to put her popularity to the test by seeking re-election as party leader. He thought this should be before the autumn, which would be the normal time for an election under the party constitution.

CBI presses for tax changes

BY JOHN LLOYD, INDUSTRIAL EDITOR

THE Confederation of British Industry (CBI) will this week propose to the Government that it change the tax laws to encourage the growth of the self-employed sector which now accounts for one in nine of the working population and growing. In a confidential memorandum on "Factors affecting the creation of jobs" to be presented to the National Economic Development Council on Wednesday, the CBI says that much greater sub-contracting of work to individuals is now taking place throughout British industry - the largest cause of the growth in self-employment. It says, "subject to a framework to prevent obvious abuse, the Govern-

ment might consider changing the onus of proof of self-employment for taxation and benefit purposes from the individual to the Inland Revenue, so that those who wished to be self-employed would be so entitled unless there were good reasons otherwise." The CBI document, in a wide-ranging analysis of present labour market trends, strongly backs moves towards greater labour market flexibility and says that regulations governing the work place "must in the first place be designed to represent the minimum burden consistent with achieving their necessary objectives. They must subsequently be subject to a review which is both regular and systematic, and when they are no longer relevant or useful they must be scrapped."

But it stresses that the greatest handicap for employers is shortage of skilled workers. Drawing on a Gallup survey of November last year, the memorandum says that "an inadequate supply of candidates with the right skills and experience was a far more widespread impediment to recruitment than the various obligations placed on employers." The Gallup survey also shows that: Over the next five years 57 per cent of companies expect to reduce demarcation and increase "multi-skilling" and job flexibility; this

move is the more likely the larger the company. Nearly 20 per cent of companies expect to increase their proportion of part time workers with a higher proportion among large and service companies. Some 35 per cent of companies expect to make more use of temporary workers. Some 36 per cent expect to increase their proportion of self-contracted work. Some 35 per cent of all companies wish to increase shift and overtime working, the proportion rising to 39 per cent in the manufacturing sector and to 41 per cent in the largest companies.

Timetable set for privatisation of water industry

BY RICHARD EVANS

THE PRIVATISATION of the water industry, potentially the most contentious of all the Government's plans to sell off public assets, will be placed on the political agenda this week with the publication of a Government White Paper (policy document) setting out a timetable. It will be the largest sale the Government has yet attempted in terms of total assets, dwarfing the flotation of British Telecom last year. The 10 water authorities in England and Wales have a total asset value of £27bn. The main proposal in the Environment Department White Paper expected on Wednesday will be a Bill at the start of the next Parliamentary session in the autumn legislating for the sale of the authorities to private investors. The formula will be for the authorities, which vary widely in size and characteristics, initially to become public limited companies wholly owned by the Government. Each would then be sold off individually as and when it was considered suitable. In practice this would mean that an authority like Thames Water, which makes an operating profit and is relatively debt free would be an early candidate, while other authorities like North West Water, which has enormous capital investment difficulties with collapsing sewers in Manchester and the cleaning-up of the Mersey, would be at the back of the queue.

What the sale will fetch is unclear. Mr Roy Watts, chairman of Thames and the most enthusiastic advocate of privatisation in the industry, estimates that Thames would be valued at about £1bn. Others reckon that all 10 authorities could fetch between £2bn and £3bn. This compares with the £3.9bn from the sale of British Telecom and around £2bn expected for British Gas. The Water Authorities Association, which acts for all 10 authorities, is strongly opposed to any fragmentation of the industry, and the White Paper is expected to support the retention of the present organisation based on natural river basins, with authorities responsible for managing the whole of the water cycle.

The WAA has acknowledged that there could be a risk of conflict between the interests of shareholders and the regulatory and community service functions, which tend to be a charge on the authority rather than a source of revenue. These functions include conservation of water resources, anti-pollution measures, land drainage, fishing, the regulation of discharge and recreation. To meet the difficulty, some kind of regulatory authority similar to Ofel (Office of Telecommunications) is expected to be set up.

Low paid said to have little protection

BY DAVID THOMAS, LABOUR STAFF

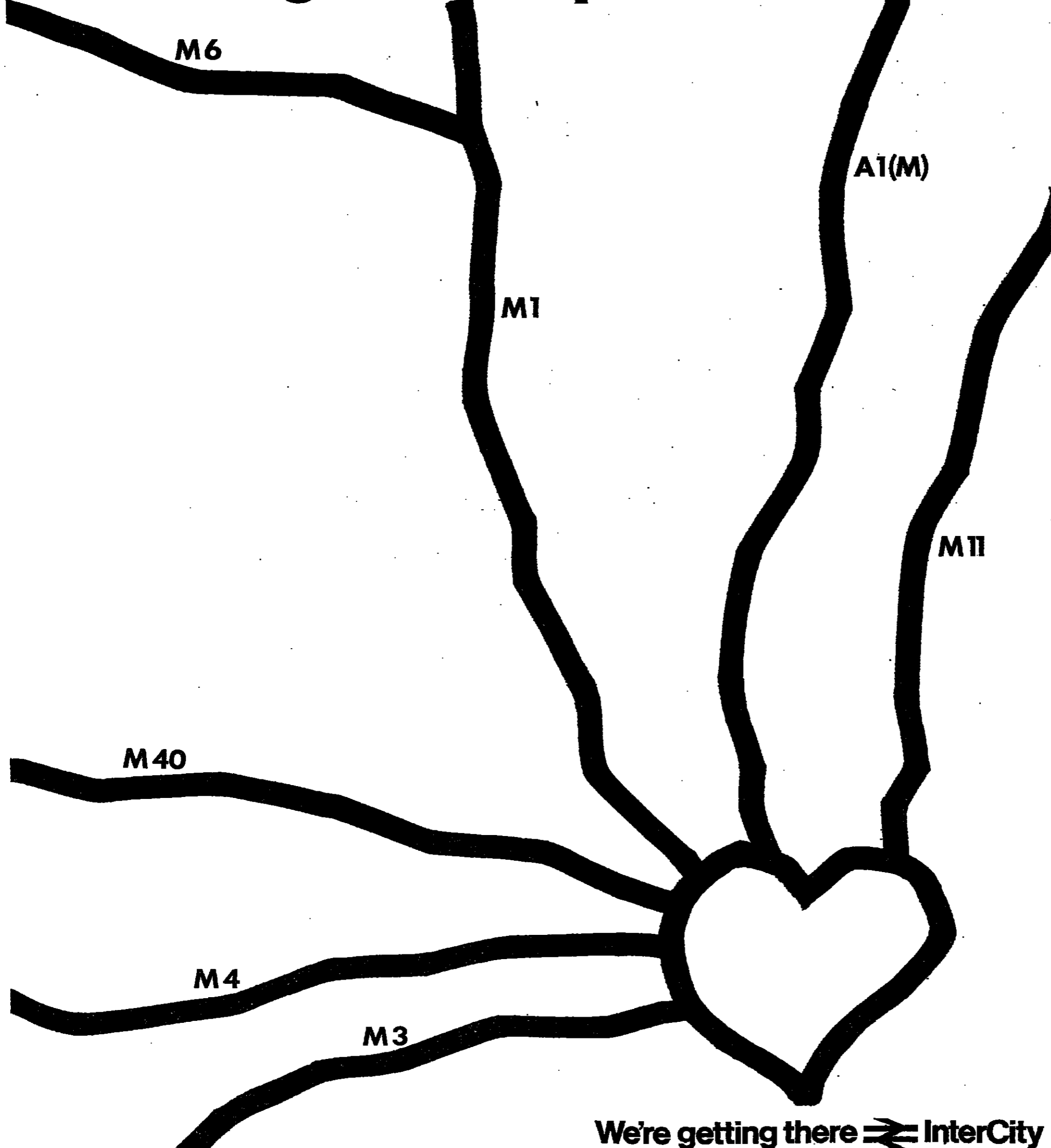
THE UK's protection for the low paid is less comprehensive than most other countries in the European Community. However, the UK Government is similar to some other European governments in wishing to weaken statutory provisions for the low paid. These are some of the main findings of a survey of minimum pay in the 12 countries of the European Community by Industrial Relations Services (IRS), an independent pay research group.

A full statutory minimum wage exists in five EEC countries, France, The Netherlands, Spain, Portugal and Luxembourg, IRS found. Belgium and Greece have minimum wages laid down, not by law, but by national collective agreements in those sectors where there is no industry-wide accord. West Germany, Denmark and Italy set minimum rates of pay across all sectors of the economy through industry-level collective agreements.

The UK and the Republic of Ireland stand alone, according to IRS, in laying down minimum wages only for certain sectors and industries where unions and collective bargaining are traditionally weak. In the UK, this is done through wages councils. All the five EEC countries with statutory minimum wages also include young workers in the coverage, according to IRS. In Britain, in contrast, the Wages Bill published last week will remove 500,000 under-21s from the scope of the wages

councils. In the EEC, statutory minimum wages lay down a tapered percentage of the adult rate from school leaving age until the full adult rate is reached at 18 in France, Spain and Luxembourg, 20 in Portugal and 23 in The Netherlands. IRS also produce figures for the numbers of workers paid at the level of the statutory minimum in those EEC countries which have one. European Industrial Relations Review, Nos 144 to 145, IRS, 67 Maygrove Road, London NW6 2EL.

Blocked arteries give businessmen high blood pressure.



Banks consider role in flotation of BA

BY LYNTON McLAN

BANK customers may receive British Airways prospectuses with their bank statements when the airline is privatised later this year. Discussions between the Government, British Airways and the banks have already started and a decision could be taken within the next few weeks. It would be the first instance of the Government using any organisation's mailing list to promote the sale of state assets. "We want to involve the high street banks in the wider distribution of the prospectus," Mr Michael Spicer, the Aviation Minister, said in an interview. He made clear that he favoured the idea of sending a prospectus to every bank customer. The Government is also examining the possibility of using the Post Office as a distribution point. "The sale of British Airways is central to the Government's wider share ownership schemes and the sale of shares in the airline is an important ingredient in the policy," Mr Spicer said. He wanted the sale of BA to involve the widest share ownership so far seen in a nationalised industry sale. There had been, he said, a "degree of interest" from the banks in the idea of using customer bank statements as a vehicle to send out the prospectus. All four leading clearing banks said they had been approached and were considering the possibility of using their customer lists for distributing the prospectus for a fee. A big difficulty could arise over the confidentiality of information about their customers. Midland Bank said the issue was being considered by senior executives who had had meetings with British Airways. "Our customer list has never before been used for distribution of material from outside the bank," it said. "The confidentiality is the conundrum, but there are changes taking place in the City and we have not ruled out the possibility of new developments."

Copyright pirates dent sales by £1bn a year

BY RAYMOND SNODDY

THE BRITISH copyright industries, ranging from books and records to computer software, are losing an estimated £1bn a year in sales worldwide because of counterfeiting. British books from the Oxford English Dictionary to Jeffrey Archer novels are being counterfeited from Amman to Jakarta, according to a study published today. The report is being sent to government ministers with an urgent appeal for tough government action to protect British copyright interests in overseas markets. The report is the work of the UK Anti-Piracy Group, whose members include the Publishers Association and the International Federation of Phonogram and Videogram Producers (IFPPV). The UK recording and book publishing industries lose £150m a year from piracy in eight countries which have been reviewed. The British copyright industry, which also includes film and video, is estimated to contribute nearly £6bn a year to the economy in terms of gross value added, about 2.6 per cent of gross domestic product. The report, International Piracy - The Threat to the British Copyright Industries, calls on Whitehall to: give a much higher priority to the pirating and counterfeiting of British goods and intellectual property; set up a senior task force to co-ordinate activities against piracy and counterfeiting; review current trade and aid arrangements where pirates are active. The study identifies Singapore as the world capital of piracy. Tape piracy is rife, UK book publishers' losses are estimated at £10m a year and it is possible to counterfeit copies of any piece of well-known business software.

Sterling policy attacked

THE GOVERNMENT'S policy of holding up interest rates to defend the pound may prove "extremely damaging," according to the stock-broking firm Rowe & Pitman, Michael Prowse writes. In the firm's latest circular, Mr Walter Ellis, an Oxford economist, says Mr Nigel Lawson, the Chancellor of the Exchequer, should stop obstructing the operation of market forces. The Chancellor, he states, is using the "highest real interest rates in the western world to prevent sterling falling when market forces, which are aware of the impending deterioration in Britain's oil account, are seeking to pull sterling down to a level at which the non-oil sector can gain markets and hence replace oil." Mr Ellis suggests that Britain's balance of payments on current account could deteriorate at a steady rate of about \$1bn a year as oil revenues decline. The £2bn surplus in 1985 would be transformed into a bare balance by 1988 and a £2bn deficit by 1993. In these circumstances, he says, the Chancellor should not attempt to resist market forces which are pressing for a substantial real depreciation of the pound. BRITISH Airways has ordered a computerised energy management system developed by BICC Transmission. The system, costing £1.4m, is intended to save the airline initially up to £1m, rising to £2m, on its annual energy bill at Heathrow airport, London. ANGIO-CARGO Airlines has protested to the Department of Transport about a rule which permits foreign cargo airlines to fly into UK airports without the noise limits or other restrictions which apply to UK registered operators. EXPORTS of Scotch whisky earned a record £994m in 1985, an increase of 7 per cent in value over the previous year. In volume terms exports were down by 2 per cent, at 225,894,422 litres of pure alcohol. This was due to a fall of 31 per cent in shipments of bulk malt whisky, particularly to Japan. Shipments of bottled whisky, which represents 70 per cent of Scotch exports, rose by 3.5 per cent.

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THE NEW MERCEDES-BENZ 200-300E SERIES



## The new Mercedes-Benz 200-300E series. Shrinks the miles. Stretches the imagination.

The Mercedes-Benz 200-300E series represents a totally new generation of medium-sized cars.

New from the ground up and from numberplate to numberplate. Yet the cars are still classically Mercedes-Benz.

In achieving this, we have re-defined the standards for cars of this size. Rewritten the ride-versus-handling equation.

And revived the pleasure of motoring.

### Engineered to be effortless.

In the new 200-300E series, the driver can feel instantly at ease with his machine.

The engines only whisper their presence, the progressive power-assisted steering transmits a precise feel of the road. The dynamic handling characteristics inspire confidence at all times.

And with six engine options, you can choose precisely the right power for your needs, from brisk to distinctly sporty.

Model	Engine size (cc)	Cylinders	Transmission (standard)	Horsepower (DIN)	Top speed (mph)	0-100kph (0-62mph)	Price (£)
Patrol 200	1997	4	5-speed manual	109	116	12.6 secs	12500
230E	2299	4	5-speed manual	136	126	10.4 secs	13685
260E	2599	6	4-speed auto	166	133	9.5 secs	16170
300E	2962	6	4-speed auto	188	139	8.2 secs	17840
Diesel 250D	2497	5	5-speed manual	90	109	16.2 secs	13790
300D	2996	6	5-speed manual	109	116	13.7 secs	15800

Each one delivers its power in a relaxed, leisurely manner. For instance, at 70mph the 230E engine is turning over at under 2500 rpm.

There are useful reserves of power built in, too. The 300E will comfortably reach 139mph.

Naturally, with this power and performance, handling and suspension have to be exceptional.

Not surprisingly the 200-300E series probably has the most highly-developed steel suspension system on any saloon car in the world. This gives the driver the confidence to take fast bends in a relaxed manner, without ruffling his passengers.

And when you need to cut the performance and come to a standstill, the massive 4-wheel dual circuit disc brakes will see to it that you come speedily to a halt in a most undramatic manner.

### Engineered to be safe.

The 200-300E series is yet another celebration of Mercedes-Benz' dedication to safety.

The passenger compartment has been made even more resistant to lateral impacts and roll-over accidents.

The front seat belts have unique electronic tensioners which work instantly in the event of a severe head-on impact, to give maximum restraint.

In order to maintain the clearest possible view of the road ahead in heavy rain, Mercedes-Benz have taken a whole new look at the windscreen wiper. Their new eccentric-sweep version cleans an unprecedented 86% of the screen.

And, with optional ABS anti-lock braking, no combination of road surface or weather conditions will prevent you from retaining

total steering control during an emergency stop - because each wheel will give maximum braking power without skidding.

### Engineered to be economical.

Science and engineering have joined forces to produce engines for the 200-300E series that have greater performance than before, with far greater economy.

Critically balanced crankshafts, reduced masses and lower friction losses combine to extract the maximum drop of power from the minimum drop of fuel.

Add to this the aerodynamically sculptured bodies, using weight saving materials, and you'll begin to see why the average\* fuel consumption figures for the new 200-300E series are at least 17% better than the figures for the comparable previous models.

The new 200-300E series offers the driver the perfect balance between everything he seeks in a car. The driving experience is smooth and effortless, yet the dynamics of the new suspension and power units encourage sporty driving.

In true Mercedes-Benz style, the 200-300E is made to be enjoyed, and admired, for a long time to come.



**Mercedes-Benz**

Engineered like no other car in the world.

Official Fuel Consumption Figures - mpg (litres/100km).  
200 5-speed manual: Urban 25.1 (11.2), 56mph 46.1 (6.1), 75mph 36.7 (7.7). 230E 5-speed manual: Urban 25.4 (11.1), 56mph 45.8 (6.2), 75mph 35.8 (7.7). 260E 4-speed automatic: Urban 23.3 (12.1), 56mph 34.4 (8.2), 75mph 28.5 (9.9). 300E 4-speed automatic: Urban 22.8 (12.4), 56mph 34.0 (8.3), 75mph 28.2 (10.0). 250D 5-speed manual: Urban 31.6 (8.9), 56mph 52.1 (5.4), 75mph 40.3 (7.0). 300D 5-speed manual: Urban 29.9 (9.5), 56mph 52.5 (5.4), 75mph 40.6 (7.0).  
\*Average based on one-third each of Urban/56/75 mph fuel consumption figures.

UK NEWS

Peter Marsh on the British and US defence officials' meeting over Star Wars  
**Bidders face uphill struggle**

OFFICIALS from the UK Defence Ministry and the US Defence Department met today in Washington in an attempt to finalise the areas of technology in which British companies could participate in President Reagan's Strategic Defence Initiative.

The talks, due to last until Wednesday, represent an effort to draw conclusions from the series of technical workshops between UK and US officials since the two countries signed a general agreement on Star Wars collaboration in early December.

The \$36bn project is due by the early 1990s to devise a strategy to defend the West from Soviet missiles, for instance by shooting them down with exotic devices such as laser guns. Plessey, GEC, Logica, British Aerospace, Ferranti and Thorn EMI are among the companies that hope to gain Star Wars contracts.

Despite the agreement, it has become clear in recent weeks that British contractors face several major hurdles to gain work under the programme.

This week's discussions, and the workshop sessions which preceded them, are largely to inform the Pentagon's SDI Organisation, the body in charge of the Star Wars programme, of the capabilities of UK industry.

The meetings have emphasised areas in which British defence contractors may have a lead on their

US counterparts. These include the design of the "battle management" computers that would control and monitor Star Wars weapons; sensors to work out the positions of Soviet missiles; and "architecture" studies to devise the correct arrangement of weapons in a Star Wars system aimed at defending not just the US but Western Europe.

Following these meetings, UK companies will have to bid on specific Star Wars contracts in competition with US defence concerns. The British companies face an uphill struggle because of their relative lack of knowledge of the key technical issues in Star Wars.

So far they have been denied access to the more classified details of Star Wars work in the US - on which about \$4bn, in the form of some 2,000 different contracts, has already been committed to US companies and government laboratories.

The first classified briefing to UK industry on Star Wars is due to take place in London on February 18. The Defence Ministry plans this week to invite to the gathering about 100 British companies, which include not only defence contractors but concerns involved in civilian applications of technologies such as electronics and new materials.

About 250 people are expected to attend the briefing, which is to be addressed by Lt Gen James Alra-

hamson, director of the Pentagon's SDI Organisation.

Another difficulty for British companies is that they have yet to be informed of the details of the December agreement, which the two governments regard as confidential.

The accord covers key issues such as the rights of British companies to commercialise technologies which they may develop while working for the Pentagon and the degree to which they will have access to technical know-how owned by US concerns.

According to the Defence Ministry, the secrecy is justified by the fact that the UK companies themselves may not wish competitors to know the conditions on which they may in future work for the Pentagon. Another reason for withholding details of the agreement is to give nothing away to other governments - such as West Germany and Italy - which are negotiating their own Star Wars deals with the US.

None the less, the secrecy has made it difficult for British companies interested in Star Wars to discover the terms of any contracts that are awarded. It is expected that at least some of the details of the December accord will be released at the London briefing later this month.

Several British companies have attempted to find alternative mechanisms to finalising Star Wars contracts, other than by negotiating

with the SDI Organisation via the Defence Ministry. They are either talking to the SDI Organisation directly - by this route Ferranti already has a draft contract for about \$150,000 to work on optical computing - or are attempting to gain contracts with US defence companies already working on Star Wars.

British Aerospace, for instance, last autumn sent a team of executives to the US to talk about Star Wars to major defence concerns.

It appears, however, that before US companies sign Star Wars agreements with overseas concerns they must seek the permission of the Pentagon. This is to ensure the deals do not transgress US Government guidelines over the transfer of technology to foreign countries.

At the very least, this provision could hold up contracts between US and UK concerns.

Martin Marietta, the US aerospace company, is particularly keen to reach agreements with European concerns over Star Wars. The company is working on a \$5m architecture study for the Pentagon, which emphasises the use of European ideas to defend the continent against nuclear attack.

Mr Bob Fisetto, vice president of Martin Marietta International, says the Pentagon has told him to hold back from signing up European concerns as subcontractors prior to formulating a general policy on technology transfer under Star Wars.

**Ministers plan inner city 'task forces'**

By John Hunt

PROPOSALS to improve employment opportunities in the inner cities, particularly among ethnic minorities, are expected to be unveiled by the Government in the next few weeks.

The plan would involve co-ordinating existing programmes and getting "value for money" rather than the expenditure of any new public funds.

The scheme is being drawn up by a committee representing a cross-section of government ministers. It will meet to discuss details tomorrow and plans could be before the Cabinet for approval on Thursday.

Work on the scheme, which would involve the creation of 10 "task forces" for various cities, has been speeded up in view of the latest record unemployment figures.

The Government would clearly like to have the scheme in operation before the local council elections in May. It is likely to be denounced by the opposition parties as a public relations exercise.

The task forces would be based on the schemes which already exist in existence in Liverpool. Under this, civil servants co-ordinate existing programmes and look for ways to improve efficiency.

**Notice of Redemption**

**Daiwa House Industry Co., Ltd.**  
(Daiwa House Kogyo Kabushiki Kaisha)  
U.S. \$15,000,000 7¼% Convertible Bonds Due 1991

Daiwa House Industry Co., Ltd. hereby gives notice that pursuant to Section 6 (B) of the Terms and Conditions of the Bonds it will redeem all of its U.S. \$15,000,000 7¼% Convertible Bonds Due 1991 on March 20, 1986 (the "Redemption Date") at a price of 102% of the principal amount thereof (the "Redemption Price").

On the Redemption Date, upon presentation of the Bonds together with all coupons maturing thereafter, the Redemption Price will become due and payable upon all such Bonds along with interest accrued thereon from September 30, 1985. Interest shall cease to accrue on and after the Redemption Date.

The Right to Convert the principal amount of the Bonds will terminate at the close of business on March 20, 1986. Holders of the Bonds are presently entitled to convert any of their Bonds into common shares of Daiwa House Industry Co., Ltd. by depositing with a paying and conversion agent during normal business hours at the place where the Bond is deposited for conversion a conversion notice in the form obtainable from any paying and conversion agent. Full details of the conversion rights and the procedure for the exercise of such rights is set out in the conditions printed on each of the Bonds. The current conversion price is Yen 510.40. No conversion right can be exercised after March 20, 1986.

The Bonds are to be redeemed (a) at Citibank, N.A., Corporate Trust Services, 111 Wall Street, 5th Floor, New York, NY 10043 or (b) subject to any applicable laws or regulations at the main offices of Citibank, N.A., in Amsterdam, Brussels, London, Paris and Zurich, at the main office of Citicorp Bank (Luxembourg) S.A. in Luxembourg, at the main office of Kuwait International Investment Co. s.a.k. in Kuwait City and the main office of Kredietbank S.A. Luxembourgise in Luxembourg. Payments at the offices referred to in (b) above will be by a United States dollar check drawn on a bank in New York City or by a transfer to a United States dollar account maintained by the payee with a New York City bank.

Daiwa House Industry Co., Ltd.  
By: CITIBANK, N.A., Principal Paying Agent

February 3, 1986

**NOTICE**

Withholding of 20% of gross redemption proceeds of any payment made within the United States may be required by the Interest and Dividend Tax Compliance Act of 1983 unless the Paying Agent has the correct tax identification number (social security or employer identification number) or exemption certificate of the Payee. Please furnish a properly completed Form W-9 or exemption certificate or equivalent when presenting your securities.

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**US biotechnology wins investment backing**

BY DAVID FISHLOCK, SCIENCE EDITOR

BIOTECHNOLOGY Investments, the N.M. Rothschild trust specialising in biotechnology shares, reports a continuing strong flow of proposals from unquoted biotechnology companies.

Lord Rothschild, its chairman, in his half-year report says it has received a further 38 proposals, compared with 78 for the previous 12 months.

Britain was strongly represented with 13 proposals, compared with 21 from the US and others from Australia, Denmark and West Germany. But the UK proposals fail to feature among the five new investments Biotechnology Investments has made.

The trust has put \$1.5m into Nordisk Genofa, of Copenhagen, the world's third biggest producer of insulin after Eli Lilly and Novo, with about 10 per cent of the market.

Nordisk began as a partnership of three scientists in 1923 but in 1984 its production and marketing activities were transferred to a limited company.

Last summer it raised \$14.2m in London and Copenhagen.

The trust's other four unquoted investments are all in the US: in Sepsacor, specialising in membrane separation technology; Biotrol, specialising in microbial treatments for wastes; Embrex, specialising in products for the poultry industry; and Immunotech Pharmaceuticals, specialising in novel peptides to control diseases of the immune system.

Lord Rothschild says that the 16 per cent rise in the trust's net asset value per share in the six months under review - making about 32 per cent for the year - reflects the recent strong performance of quoted biotechnology shares on Wall Street.

Investor interest has been stimulated, he says, by bids for two US companies, Hybritech and Genetic Systems.

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# CONSTRUCTION CONTRACTS

## Global orders worth £52m for Lilley

LILLEY, Glasgow, has been awarded contracts worth nearly £52m. They include a major sewerage scheme in Milwaukee, US, a prison unit in New York State, a site preparation scheme in Hong Kong, several factory developments in the UK and an ice-rink in Livingston, near Edinburgh.

Lilley's American subsidiaries have won awards totalling \$5.5m. Harrison Western Corporation has been awarded a \$5.7m contract for construction of a 17-ft main sewer tunnel in Milwaukee, Wisconsin. John W. Cowper Co will build two inmate housing units worth \$1.6m at the Wyoming Correctional Facility at Attica in New York State, and the Marx Construction Co has secured all-

related contracts worth over \$400,000. In Hong Kong, Lilley Construction will undertake a \$2.6m site preparation contract for a new housing development in the Tai Po/Fanling area.

Lilley Construction has secured several factory building orders in the UK. In Hampshire, work will start shortly on a £1.2m factory and office block for Municipal Mutual Insurance at Farnborough which will be occupied by Loma Engineering, with complete design and building responsibility for the project.

At Petersfield, construction of two three-storey blocks of sheltered accommodation worth £1.6m is being undertaken for East Hampshire District Council.

The Scottish division will

build four retail warehouses and an ice rink for Ravenstone Securities (Holdings) at Almondvale, Livingston, in a contract worth over £2.2m. At the Motherwell Food Park, Bellshill, near Glasgow, Melville Dundas and Whitson will construct a £1.8m food processing unit for the Scottish Development Agency, to house a Japanese food processing company, Kibun (UK). A contract has also been placed by Grosvenor (Perth) for a £1.3m multi-storey car park in Canal Street, Perth.

Both Lilley Construction and MDW have won Ministry of Defence contracts. Lilley is undertaking a £1.1m contract for the FSA to construct a re-

inforced concrete culvert and ancillary work adjacent to the quay wall in Tingo Berth II in the Naval Dockyard in Royal MDW has secured an order for a \$81,000 Territorial Army Centre in Cathcart, Glasgow.

In Leeds, George Longden Construction has begun work on a £1m plus contract for the City Council to build 43 houses, communal rooms and associated works in the Hunslet district. In the Dumfries and Galloway region in Scotland, Robison and Davidson will undertake several new building, rehabilitation and renovation housing contracts for Nithsdale District Council and Annandale and Eskdale District Council with a value in excess of £800,000.

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## City complex in Glasgow

SIR ROBERT McALPIN & SONS has been awarded a £2m contract to build the Princess Square shopping centre in Glasgow. Joint developers are Glasgow Royal Exchange and Tourism Development Company. The speciality shopping complex situated behind Buchanan Street covers an area 90 x 90 metres. The existing stone buildings fronting Buchanan Street will be refurbished while the remaining buildings on the other three sides will be demolished except for a 17-ft main sewer tunnel in December 1987. The centre will house 70 shops, restaurants and bars on four galleries upper floors plus a central courtyard below street level containing a food court and providing the stage for continuous entertainment which can be viewed from all levels. The central courtyard will be covered by a glass roof to form an atrium.

MENYEN ROOF NORTHWEST has started work on a £7.2m management contract for construction of a manufacturing facility and offices for Thomas's (a division of Mars GB), in Leeds. The company is also responsible for the design which will house pet food processing, and will include offices, car park and ancillary works. Contract completion is scheduled for late 1986. Henry Root Southern has been awarded a £4m contract for construction of a reinforced concrete multi-storey car park in Birmingham to be built over the British Rail Snow Hill Station, to provide 870 car-parking spaces. Work on the 62-week contract has started. Work on a £1.2m contract for construction of a 56,000 sq metres warehouse with attached offices for ICL in Stevenage has also started. In addition, the contract involves construction of roads, car-parking, pump house, store and landscaping. The 42-week contract is scheduled for completion in November.

COSTAIN DUBAI COMPANY, a joint venture comprising Costain International and H. E. Humaid bin Drai, has been awarded a £1.1m contract for the civil engineering work associated with a new labour blending and packaging plant at Jebel Ali Port, Dubai, United Arab Emirates, by BP Arabian Agencies. The contract involves construction of a steel-framed blending building of about 3,000 sq metres, together with boiler house, garage, administration block and gate-house.

## £10m awards won by Balfour Beatty

BALFOUR BEATTY CONSTRUCTION has been awarded £10m contracts throughout England and Scotland. At Hillend in Fife, work has started on a £2.8m factory for the Scottish Development Authority which will house the new manufacturing facilities of Optimal Coatings Company, at Scone, Perth. County Durham, and a £2.9m design and construction contract will provide Black and Decker warehouses, sq ft of refurbished warehousing and office space on an existing industrial site in Newcastle. Two contracts totalling £1.8m

have been awarded for refurbishment of the former Royal Turf Head Hotel in Grey Street to form shops and offices together with a development at the rear of the hotel. Other contracts include a scoreboard at Meadowbank Stadium in Edinburgh for the Commonwealth Games, a vehicle maintenance depot at Cargo Fleet, Middlesbrough, a car park for IBM at Greenock, and Decker warehouses, sq ft of refurbished warehousing and office space on an existing industrial site in Newcastle. Two contracts totalling £1.8m

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## Brazier active in Southampton

THE BRAZIER GROUP, Southampton, has been awarded contracts valued at £8.5m. They include a £2.7m library extension for Southampton University and a £1.5m community psychiatric centre at Marchwood near Southampton. The group has also been awarded refurbishment contracts including a £500,000 contract at Marlands House, Southampton and alterations and an extension to Royal Pier Gatehouse, valued at £450,000. Two contracts for the Property Services Agency are a £200,000 refurbishment to Government House, RMA Sandhurst, and re-roofing the administration block HARDE in Chertsey, at £450,000.

## New facilities for Ind Coope

A £30m capital programme is under way at Ind Coope Burton Brewery plant in Staffordshire. The work includes building a new kegging hall along with warehousing facilities, and has been awarded to NORTHWEST BUILDERS and is worth over £8m. All new structures will be steel-framed with mass concrete pad foundations and ground-bearing concrete floors. Some 18,000 sq metres of slab construction is involved with a further 6,000 sq metres of refurbishment. Sogby Brothers, Wellingborough, has awarded Northwest Heist a contract worth about £2m to extend its pork pie factory in Northamptonshire.

DRAKE & SCULL ENGINEERING (a Simon Engineering company) has obtained a contract at a Shell Stanlow plant. The £1.3m order is for the heating and ventilating services at the new Shell Lubricants Centre and has been awarded by M. W. Kellogg & Co Ltd, the designer and main contractor.

# For the benefit of all shareholders

“For many years, the fashion both in Government and in industry was to favour mergers and amalgamations. No doubt mergers have brought advantages in some cases, but it is now quite clear that the fashion for industrial elephantism was greatly exaggerated. I believe that there are cases where businesses are grouped together inefficiently under a single company umbrella. They could in practice be run more dynamically and effectively if they could be “demerged” — I apologise for that word which has now become part of the jargon — and allowed to pursue their own separate ways under independent management. The present tax rules can in practice effectively discourage demergers of that kind, by charging the assets of the “demerged” company to advance corporation tax and income tax as distributions.

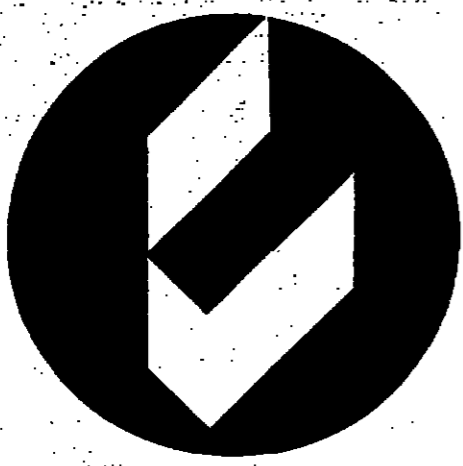
I propose to bring forward, during the passage of the Finance Bill, measures to ease the tax charge on distributions of that kind, subject to certain safeguards, and where they are concerned solely with the genuine splitting off of independent trades within the corporate sector.”

The Rt. Hon. Sir Geoffrey Howe,  
Budget Statement,  
26th March, 1980.

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OSAKAYA SECURITIES (HONG KONG) LIMITED  
COSMO SECURITIES CO., LTD. NEW YORK REPRESENTATIVE OFFICE  
COSMO SECURITIES CO., LTD. ZURICH OFFICE

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### PRELIMINARY STATEMENT OF RESULTS FOR THE YEAR ENDED 31st DECEMBER 1985

"Petrofina's share in the Group's consolidated profit for 1985 amounted to 17,070 million Belgian francs compared with 15,505 million Belgian francs in 1984, an increase of 10.1%.

Results have improved steadily over the past 15 years, with profits today representing 22.6% of shareholders' equity which itself has risen by 11% during 1985.

Only actual operating income is included in this profit figure, all non recurring income having been offset by writing off extraordinary charges.

The improvement in results is due primarily to our activities in the refining-marketing sector.

Notwithstanding the current instability of our industry, the Board feels able to propose to the Annual General Meeting of 12th May, 1986 a dividend net of withholding tax of 330 francs, an increase of 10%.

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The Council of the Stock Exchange has admitted the above mentioned securities to the Official List which securities represent the maximum which may be issued pursuant to the Offers for Petrofina Holdings PLC. Particulars of each of the securities are available in the Explanatory Notes. Copies of the Listing Particulars dated 6th January, 1986 containing further details in connection with the issue of these securities pursuant to the Offers for Petrofina Holdings PLC, together with particulars of all of these securities may also be obtained from the Company Announcements Office, The Stock Exchange, Throgmorton Street, London EC2P 2BT until 5th February, 1986 and during normal business hours on any weekday (Saturdays and public holidays excepted) until 14th February, 1986 from Anglo Nordic Holdings PLC, Anglo Nordic House, High Street, Hermal Hempstead, Hertfordshire HP1 3AG, Standard Chartered Merchant Bank Limited, 33-36 Gracechurch Street, London EC3V 0AX and Capel-Cure Myers, 65 Holborn Viaduct, London EC1A 2EU.

Dated 3rd February, 1986.



## INTERNATIONAL APPOINTMENTS

### ITT reshuffle in US and Europe

BY PAUL TAYLOR IN NEW YORK

ITT, the US-based multinational conglomerate, has announced that Mr William Smith, the group's 41-year-old chief technical officer and the executive in charge of its struggle to adapt ITT's System 12 digital telephone exchange switch to US standards, has resigned to rejoin American Telephone and Telegraph (AT&T), his previous employer, as an executive director of network planning at AT&T's Bell Research Laboratories.

At the same time, ITT has announced a series of senior management appointments in its European telecommunications operations, aimed at strengthening research, marketing and manufacturing efforts, particularly for its System 12 digital switch. The new senior managers will report to Mr Daniel Woodcock, president of ITT Europe, and an ITT group executive vice president.

#### Blow to System 12

Mr Smith's decision to resign from ITT, where he had been the group's technical director in Europe until his promotion a few months ago, appears to be a further blow to ITT's plans to adapt System 12 to US standards. Mr Smith retained his European responsibilities after becoming the group's chief technical officer, and had recently led the group's accelerated effort to make the System 12 switch ready for the US marketplace.

He apparently decided to leave ITT for personal reasons. However, his departure comes at a critical time for ITT, which recently announced delays in the installation of its first commercial System 12 switch in the US because of software difficulties and other problems in adapting the sophisticated equipment to US standards. That delay has raised questions on Wall Street about whether ITT will miss a major opportunity to sell System 12—its flagship product developed over a decade at a cost of \$1bn—in the new independent, local Bell telephone companies. ITT spent \$105m last year in its efforts to adapt System 12 for the US market.

While ITT has been very successful selling System 12 in Europe and elsewhere outside the US, its flagging efforts to adapt the system for sale in the key US market have raised questions about the group's ability to gain a major share of the currently booming US market for such equipment.

The group recently commissioned a marketing study of the US digital equipment market by Booz, Allen and Hamilton—the management consulting firm—which is understood to be nearing completion. ITT says the report represents "another input to management."

There has been speculation on Wall Street that ITT might be considering scaling back its efforts to bring System 12 to market in the US in order to

concentrate on sales of the advanced telephone switching gear in Europe. While ITT has given no indication that it may be preparing to scale back or abandon its efforts to adapt and market System 12 in the US, the project, like ITT's other major businesses, is under constant review by senior executives, and by the board at its regular monthly meetings. ITT's board is due to meet next on February 11.

#### European success

At the same time, the appointment of three key new executives to ITT's Brussels-based European telecommunications operations underlines the group's attempt to capitalise upon the success of System 12 orders in Europe—and ensure that delivery schedules are met and that research updating System 12 for the European Customers continues.

The three new appointments, announced by Mr Woodcock, are: Mr Gerard Zeldner, aged 49, will replace Mr Smith as general technical director of ITT Europe. Mr Zeldner, a 20-year veteran of ITT's West German standard Elektrik Lorenz (SEL) subsidiary, will be in charge of 9,500 scientists, engineers and technical staff involved in product development and long term research. As part of his responsibilities, Mr Zeldner will have full management responsibility for all the technical aspects of System 12 which he helped

develop while head of SEL's technical department. Mr Woodcock noted that the appointment represented evidence of ITT's "firm commitment to research and development in Europe," and added, "System 12 is a key element in our long-term telecommunications strategy."

Mr David Levy, a former vice president in charge of large systems and peripherals development at Canada's Mitel telecommunications equipment group, is named director of ITT's International Telecommunications Centre in Brussels. The Centre is responsible for the development of System 12 and related international products. Mr Levy, who has also worked for Bell Northern Research, IBM and Marconi, will be in charge of 150 engineers and support staff working on further development of System 12, which is in service in nine nations and has been ordered by administrations in 21 countries.

Mr Alan Lutz, aged 40, was named to the new post of vice president and group executive for international operations in ITT Europe. Mr Lutz, a former vice president of switching in Northern Telecom's integrated network systems group, will have headquarters responsibility for ITT's European telecommunications companies in Austria, Denmark, Finland, Holland, Portugal, Sweden and Switzerland—which manufacture telephone switching and transmission equipment for local telephone companies.

### Goodman Group head quits

By Dal Hayward in Wellington

MR PETER SHIRKCLIFFE, chief executive of the Goodman Group, New Zealand's aggressive bakery, flour-milling and food concern, has retired 10 years after becoming chairman.

"The chief executive's role has grown to the stage where it is now best suited to someone around the age of 40," says 54-year-old Mr Shircliffe.

A new managing director has not yet been appointed.

Mr Shircliffe was chairman of the group between 1976 and 1978, and then took over the role of managing director, which gave him more direct involvement in the company.

During his time as chief executive the company, which was earlier known as A. S. Patterson, has expanded and developed rapidly. It has also adopted an international role, and is now one of New Zealand's most internationally-minded companies.

Mr Shircliffe has been appointed chairman of the new government-created Marketing Development Board. The Board has three main areas of responsibility. It will advise the government on New Zealand's marketing development, will put together marketing proposals to encourage exporters to seek out new markets, and will provide a bridge between the private sector and the government.

### Toshiba change at top

TOSHIBA Corporation, the Japanese electrical products concern, has appointed Mr Sugiehiro Watari, aged 60, president and chief executive, with effect from April 1. He succeeds Mr Shoschi Saba, 66, who has filled the posts since 1980 and is to be chairman.

Mr Watari, who has been with Toshiba since 1948.

#### Finnish MoF

MR KARI NARS, former managing director of Bank of Helsinki, has been appointed director for foreign borrowing at Finland's Ministry of Finance. Mr Nars resigned from BofI shortly after the bank was acquired by Union Bank of Finland in December.

### Chairman-elect at Union Pacific

UNION PACIFIC Corporation, the New York-based railway company with interests in natural resources, plans to appoint Mr Drew Lewis, aged 54, former US Transportation Secretary, chairman and chief executive in October next year, when Mr William S. Cook retires, report agencies.

Mr Lewis became a director last month, and is to become chairman and chief executive officer of Union Pacific Railroad Company, a subsidiary, on April 1.

He is next year to succeed Mr Cook as president of the parent company, and to fill the currently vacant post of chief operating officer, ahead of taking on the further duties.

CHEVRON Corporation, the

international oil company with headquarters in San Francisco, has announced that Mr J. Dennis Bonney, vice president, has been elected to the board.

Mr Bonney, 55, joined Chevron in 1960 and has been a vice president since 1972. As vice president, Mr Bonney has most recently been responsible for some of Chevron's foreign operations. He is scheduled to assume responsibility for logistics and trading.

TEXACO, the international oil company based in White Plains, NY, has elected Mr David C. Crikelair as treasurer, in succession to Mr Edward W. Wolahan, who has retired.

Mr Crikelair, who will also be head of the company's finance

department, has been senior assistant treasurer and assistant general manager in the finance department since May last year.

MR RENE WILDI has been appointed general manager of the Middle East-Africa region by Dow Chemical Europe, the Swiss-based regional subsidiary of Dow Chemical of the US. He will continue in his current positions as a vice-president of Dow Chemical Europe, general manager for Switzerland and a member of the Dow Chemical Europe operating board.

In the Middle East-Africa post he takes over from Mr R. M. Kila, who has been appointed director of strategic planning and diversification of Dow Chemical Europe, and a vice president.

### New chief for Crown Corporation

By Owe Wellington Correspondent

MR JOHN HUNN, former general manager of New Zealand's Development Finance Corporation (DFC), has been appointed managing director of Crown Corporation, the diversified New Zealand concern with interests in agriculture and horticulture, meat processing and agricultural machinery.

Mr Hunn, 48, who has been with the DFC for the past 12 years, has been given the credit for taking the DFC from a "bedraggled financial institution to one with an international reputation and interests in several countries."

Over the past few years, Crown has increasingly developed its financial services.

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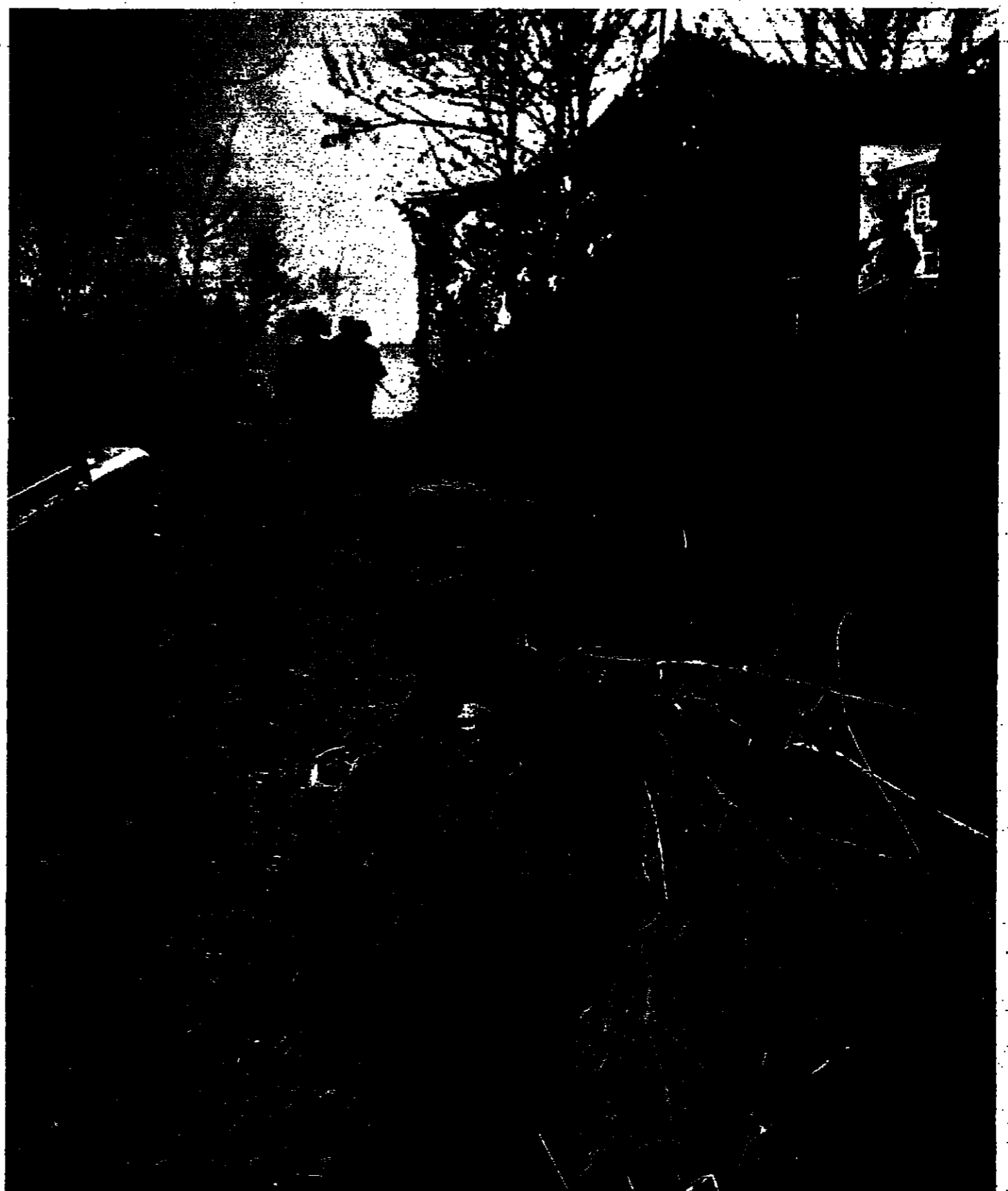
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# FINANCIAL TIMES SURVEY

Monday February 3 1986

# GREECE

Anusterity measures to bolster the Greek economy have caused growing dissatisfaction and labour unrest, but significant foreign policy changes by the Socialist Government have met with little public reaction among voters so far.

## A dramatic U-turn in policy-making

A NEW air of realism is blowing through the corridors of power in Athens, as Dr Andreas Papandreu's Socialist (PASOK) Government settles into its second four-year term in office.

The Socialists trounced the conservative "New Democracy" Party for the second time running in general elections last June, with 46 per cent of the vote—a remarkably small erosion of just two percentage points in support, compared with the 1981 PASOK victory, which brought Greece's first-ever Socialist Government to power.

Armed with this renewed mandate, Dr Papandreu has proceeded to launch a dramatic U-turn in both economic and foreign policy. Its success or failure could have far-reaching consequences both for PASOK and for Greece.

On the economic front, the Socialists' new philosophy is encapsulated in a package of economic stabilisation measures introduced last October, with the aim of bringing the runaway public sector and current account deficits under control and thus averting a possible future foreign debt crisis.

The Socialists have moved away from the easy incomes and spending policies of their first term which, they argue, were necessary in order to redress economic inequalities in Greek society which had built up under the post-war administrations of the Right.

BY ANDRIANA IERODIACOU in ATHENS

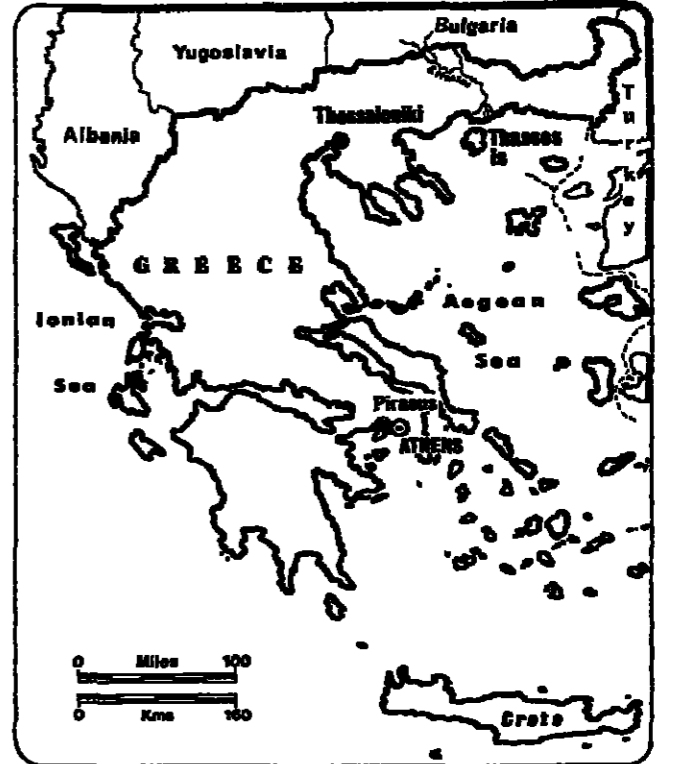
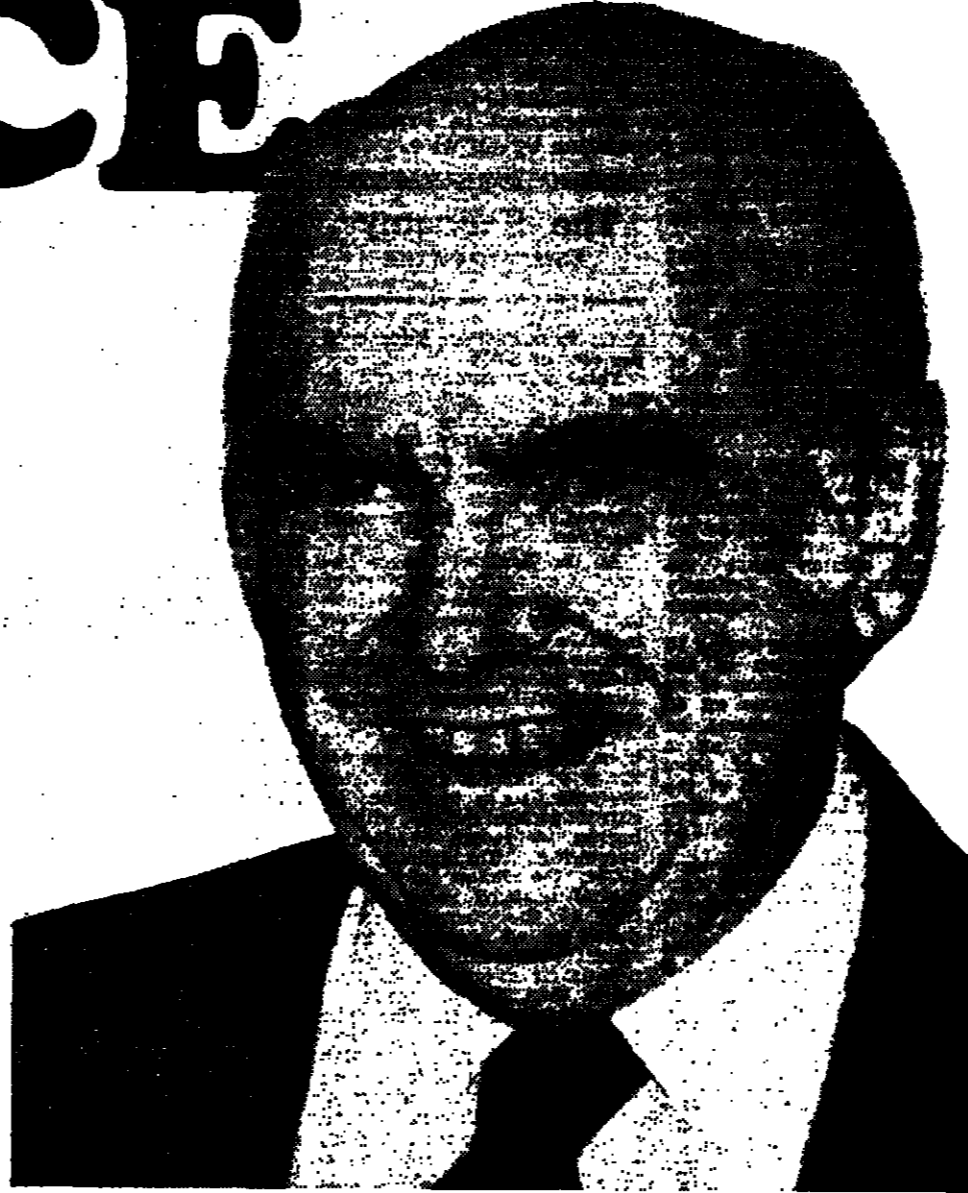
Under the new austerity regime, the Government has substantially reformed the system of wage indexation which it first introduced in 1981, and imposed a two-year freeze, to the end of 1987, on any other salary and wage increases. An import deposit requirement has been introduced for a little under half of the products coming into Greece and the drachma has been devalued by 15 per cent to boost exports. Austerity budgets have been imposed on the central government and a two tranche ECU 1.75bn loan secured from the European Community, to help in servicing the foreign debt which, according to Bank of Greece figures,

has virtually doubled to about US\$15bn since 1982 and even more according to independent experts.

The Government's targets are ambitious. The Socialists hope by the end of this year to have slashed the public sector borrowing requirement by four points as a percentage of GDP, to 13 per cent, to have reduced the current account deficit from over \$3bn which it is estimated to have reached in 1985, to \$1.7bn and to have trimmed inflation from more than 20 per cent in 1985 to about 16 per cent.

Although it has attracted much less attention than the economy, Dr Papandreu's re-orientation of foreign policy has also been pronounced. The Prime Minister now states clearly that Greece is in the EEC to stay, and no longer raises the prospect of NATO withdrawal. The aim is to steer relations with the US into calmer waters: the thorny issue of the US bases, the Prime Minister now suggests, could be resolved by negotiating a new arrangement to replace the present five-year agreement for their operation, which the Socialists told voters would expire in 1988.

It is all a far cry from PASOK's 1981 election pledges



Dr Andreas Papandreu, Prime Minister of Greece (left): a man with ambitious plans for economic reform while mending fences with his country's western allies

to pull Greece, then a brand-new EEC member, out of the community, as well as NATO, and to "close down the bases of death."

Dr Papandreu does, however, stick to his support of nuclear disarmament: his close ties to the Arab World, including Syria and Libya, in spite of agreeing to work with the US to combat Libyan-backed terrorism, and his tough policy line on Turkey. Dr Papandreu makes clear that Greece will continue to abstain from NATO exercises in the Aegean until the island of

Lemnos is included in the manoeuvre plans. This would mean over-riding Turkish objections to the militarisation of the strategically located Aegean island.

The Socialists also continue to predicate a dialogue with Ankara to resolve disputes on the sharing of sea and airspace rights in the Aegean, upon the termination of the 11½ year Turkish military occupation of the northern part of Cyprus.

So far, these foreign policy changes have met with little public reaction. Greek voters,

showing more maturity than their political leaders have often credited them with, appear to accept the reasons of Realpolitik which dictate mending fences with the country's western allies.

The same cannot be said about the economy, where the abrupt arrival of lean times has, temporarily at least, dynamited the consensus which gave the Socialists their substantial electoral victory.

Greeks who voted for PASOK with an eye to their wallets, well-satisfied with the

increases in real income of the administration's previous term, accuse the Government of having been unduly misleading in insisting all the way to the polls that the economy is as safely set on the path to recovery.

Communist voters who cast their ballots for PASOK with the tactical purpose of preventing a return of the right to power, are now angered at being accused of collusion with the right when they support anti-austerity strikes.

Most important, the economic about-face has triggered a crisis of self-confidence within PASOK itself. Party cadres resent having to promote the new economic philosophy at the grass roots after having been excluded from the original decision-making by Dr Papandreu and a close circle of advisers.

They feel that PASOK's image as the democratic political force par excellence, jealously fostered since the party's inception as an opposition movement to the colonels' dictatorship, and a key ingredient in its rise to success,

has been tarnished by mass expulsions of leading trade unionists who dared to voice disagreement with the austerity measures.

Polls show the Government's popularity to have tumbled to its lowest point since 1981, while the period from October to December was punctuated by strikes and protest demonstrations.

However, the Government is now of the opinion that the worst is over. It points out that the strike wave has receded with the New Year, and that, despite the autumn unrest, 1985 was not the record year of the decade in terms of working hours lost: 1980, the year before the Socialists' election victory, when frustration with the Conservative government was at a peak, still tops that league table.

Yet Mr Papandreu can hardly be sure that the current year, which promises to see growing dissatisfaction with the austerity measures, will not provoke a resurgence of labour unrest.

CONTINUED ON PAGE 2



# PUBLIC POWER CORPORATION

## A dynamic and growing enterprise

### The Company's profile

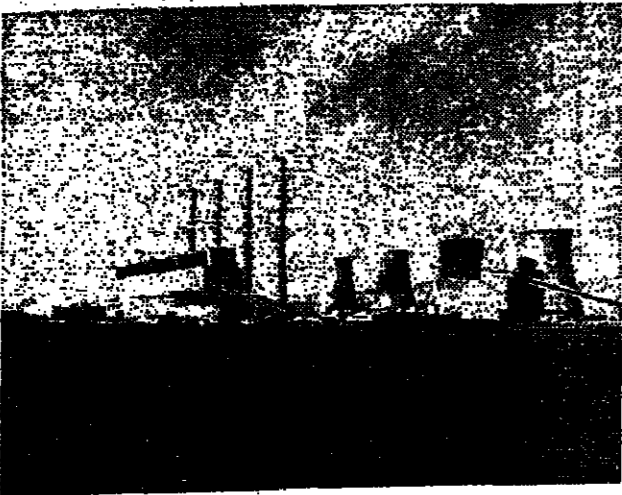
Public Power Corporation, a state-owned enterprise, is the sole producer and distributor of electric energy in Greece.

The corporation was established in 1950 and began operations in 1953 with the bulk sale of electricity to the existing electric utilities at that time.

Between 1954 and 1963, PPC acquired approximately 400 utility companies and became substantially the sole producer and distributor of electric energy in the country. Only a very small portion (1%) of the total electricity consumed is produced by self-producers.

The most important of the previously mentioned acquisitions was the acquisition, in 1961, of the "Athens-Piraeus Electricity Company" which was serving the largest metropolitan area of Greece.

Today, PPC's main activities include the development and operation of the major lignite mines of the country, which provide fuel to the big lignite fired power stations, the operation of thermal and hydro power plants and the transmission and distribution of the energy produced to the residential,



The lignite-fired power station of Kardis, Ptolemais, the largest and most modern of the lignite-fired stations which feed the PPC's interconnected system. It consists of four units with a total generating power of 1,200 MW and an annual capacity of 8 billion KWH. For the protection of the environment, the station is equipped with highly efficient electrostatic filters in accordance with international specifications.

commercial, industrial, agricultural and other consumers.

The Corporation's installed capacity is totalling 7,341 MW, while the total energy produced in 1985 is expected to be 26,100 GWH. PPC currently employs 30,000 people and it is serving 5.1 million customers. Its net fixed assets, valued at historical cost, totalled 2,650 million U.S.\$ at year end 1984 (up 33.8% from the previous year) while total assets were 3,270 million U.S.\$ on the same date.

Total revenue has increased 25.2% in 1984 to 950.0 million U.S.\$ and total expenses (including interest and depreciation) increased 22.2% to 838.7 million U.S.\$. Thus, PP's net profit was 11.3 million U.S.\$.

### Achievements and prospects

As electricity represents a considerable part of the total final energy consumption in Greece (18.5%), PPC's investment policy constitutes a major part of the Greek energy policy.

One of the main goals of this policy is the promotion, to the highest possible degree, of the country's independence from external sources of energy supply.

What this means for PPC is the implementation of an ambitious investment programme, based on the use of domestic resources in electricity generation and mainly lignite, which is the most abundant energy resource in the country, and hydro-potential.

Up to now, the achievements in this field have been impressive.

At the end of 1973, the Corporation's installed capacity was:

- 58.0 per cent lignite and hydro
- 42.0 per cent oil

Today, the structure of PPC's installed capacity has changed drastically.

More specifically, the lignite and hydro units represent 72.9 per cent and the oil fired units 27.1 per cent of the Corporation's total installed capacity.

PPC is committed to increase further the share of domestic energy sources in total energy generation.

Thus, in terms of capacity, the share of domestic resources has been planned to increase to 80.0 per cent of the total up to 1989.

In terms of energy, it is estimated that, in 1989, the main domestic resources (lignite and hydro-

power) will cover 95.0 per cent of the total input to the National Interconnected System.

The restructuring of capacity goes together with its increase.

In order to meet the increasing demand for electricity, PPC's programme provides for the period 1986-1989, that new generating units totalling 1,710 MW of installed capacity will be put into operation in the interconnected system. 1,210 MW of this capacity will represent lignite-fired units and 500 MW hydroelectric units.

However, it must be mentioned that PPC is not only aiming in developing conventional energy sources.

In an effort to economise on non-renewable energy resources and fuel oil in particular, the Corporation has planned the use of the Geothermic potential of the country for electricity generation.

According to this plan, geothermoelectric units of a capacity totalling 120 MW will have been installed in the island of MILOS (1994). These units will provide energy not only to MILOS but also to other neighbouring islands and the mainland via submarine cables. The first experimental geothermo-electric unit in MILOS, with a capacity of 2 MW, is already in the final stage of completion.

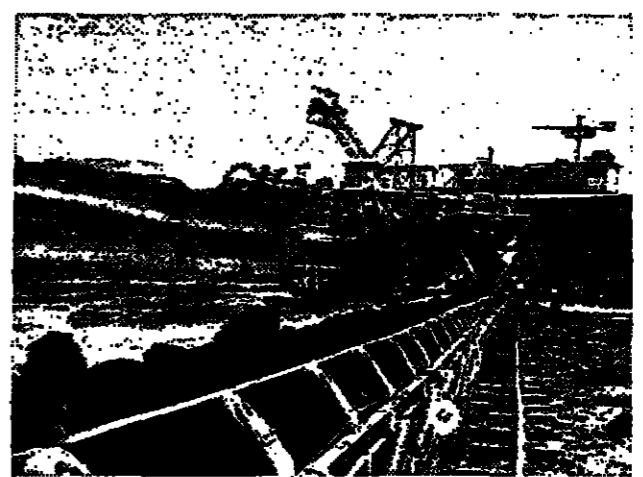
In the Eolic sector, where the conditions in the country are very favourable, a number of demonstration projects have already been completed or are under construction, while a specific 5 year programme is in the stage of implementation.

According to this programme Eolic units of a total capacity of 3.5 MW will be installed in 30 islands. In the Solar field and specifically in the photovoltaic generation, two installations of 50 and 100 KW are already in operation and three are under construction.

In addition to the increase and restructuring of capacity, other major elements of PPC's investment policy today are:

- a. The upgrading of the technological base, with the inflow of automation and computerisation in many fields, such as power plant operation, load dispatching etc.
- b. An effort for an increased domestic value added in its new equipment. This effort is not simply based on balance of payment considerations but also on long-term real cost and local technology advancement considerations.

In money terms, PPC's investment programme for the period 1985-1989 implies a total spending of 3,831 million U.S.\$ equivalent. Of this amount,



Strip-mining operation at Megalopolis with a mechanical excavator fitted with rotating grab-buckets. The excavator can handle up to 1,200 tons and can strip-mine 2,250 cu. m. of lignite per hour.

1,643 million U.S.\$ will be spent in power generating units, 650 million U.S.\$ in mining projects and the rest in other projects including transmission and distribution facilities etc.

These numbers show that a considerable amount of money will be spent in electricity generation, transmission and distribution.

Of course, considerable spending for investment purposes is not something new with electric utilities. The electric utility industry, as one of the most capital intensive industries, had always very large capital requirements in order to meet the continuing increase in electricity demand. However, after the two energy crises, the new orientations of the energy policy and mainly with the emphasis placed on the development of domestic energy sources and the increased pollution controls, the capital requirements are substantially higher than those faced 10 or 15 years ago.

PPC's achievements in financing its capital requirements have been fairly satisfactory. A considerable part of the total requirements (more than 25%) has been planned to be covered by internally generated funds, another part will continue to be covered by EDC sources and the rest will be raised in the capital markets, domestic or foreign, where PPC has a well established name over the years.

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## GREECE 2

# Tough reforms at last

New measures lay foundation for recovery

THE PRESENT parlous state of the Greek economy has cast a pall of gloom over the country, which will not be dispelled until the austerity package adopted by the Government last October begins to bear fruit.
The U-turn in economic policy made by Mr Andreas Papandreu, the Prime Minister—similar to the one operated earlier by the Socialist government in France—apparently took the Greek population by surprise.

### The Economy

ROBERT MAULTNER

"Why weren't we told earlier about the economic crisis?" is a question frequently asked by the Greeks.
The answer is probably that Dr Papandreu, the former Economics Professor, was over-ruled by Mr Papandreu, the politician, who wanted to get last summer's election out of the way before adopting what he knew to be highly unpopular measures, not least within his own PASOK party.

The positive side of the picture is that, while the stabilisation package was certainly overdue, it was at least severe enough to convince international opinion that the Government was seriously tackling Greece's economic problems.
The main measures were a 15 per cent devaluation of the drachma, the imposition of an import deposit scheme on 40 per cent of total imports, an incomes policy based on a radical modification of wage indexation, a reduction of the public sector borrowing requirement (PSBR) and a curbing of tax evasion.

Urgent as the measures were—the OECD has welcomed them in its latest report on the Greek economy as providing the right medicine—it would be a mistake to think that there has been a sudden unexpected deterioration in the Greek economy. Many years of expansionary macro-economic policies, punctuated by only very short intervals of retrenchment, have contributed to a steady worsening of the balance of payments, the rate of inflation, public sector deficits and the country's indebtedness.

The current account first of all deteriorated sharply as a result of the first oil crisis in 1973, when the deficit reached more than 7 per cent of GDP. After several more favourable years, it took another plunge in the wake of the second energy crisis of 1979, doubling in the space of one year to \$1.9bn.
In subsequent years, the deficit has fluctuated between 4.5 and 6.6 per cent of GDP, until last year when it is estimated to have risen mas-

normally attaches to its credit. For some reason, the Prime Minister feels that the terms on which the EEC granted its six-year Ecu 1.75bn (\$1.03bn) loan last November are more acceptable. Some observers suspect that, while the Government certainly hopes it can fulfil the conditions, it has calculated that Greece's partners will not allow it to go to the wall for political and strategic reasons, even if those conditions are not met by the deadline.

Yet the fact is that while Greece has been allowed another one-year's delay in the introduction of the value-added tax system and a similar extension before it must abolish export subsidies, Mr Costas Simiitis, the Economy Minister, agreed to a number of tough economic targets for Greece.
The Public Sector Borrowing Requirement (PSBR) which, last year attained the record level of 17.5 per cent of GDP, is to be brought down by 4 per cent points in 1986 to about 13 per cent and a further 4 percentage points in 1987.
An inflation target of about 15 per cent by the end of 1986 has also been set, compared with an inflation of 46 per cent in 1985 (OECD figure) or 21 per cent according to some official Greek figures, which tend to vary disconcertingly.

The Greeks have also given an undertaking to reduce substantially the rate of domestic credit expansion both in the current year and in 1987, and progressively to bring down the current account deficit to allow the stabilisation of external borrowing, estimated to reach more than \$19bn in 1988.

### Conditions

One of the most important conditions is that the loan is being made available in two tranches and that the second of these instalments, due in January 1987, will be liberated only after a review by the EEC of the results of Greece's stabilisation programme.

Whereas many doubts exist in Greece about how effective an austerity programme will prove to be—in particular, it is felt in some business quarters that the devaluation of the drachma was not enough—all experts agree that, at best, the package will lay only the foundations of a recovery.

OECD strongly emphasises that effective supply side measures must be taken by the authorities and the business sector if productivity is to rise and a better all-round economic performance is to be achieved.
Special attention will have to be given to the state-dominated and antiquated financial system, which is no longer geared to serving a market economy and promoting competition.

Used mainly to provide subsidies and incentives to selected sectors of the economy and to lower the cost of financing of the public sector, it has failed to meet the needs of private industry and led to a progressive decline in private investment.

Though business is obliged to rely heavily for its financing on banks and specialised credit institutions (SCI), the banks have only limited freedom to allocate credit. Some 75 per cent of bank portfolios are earmarked for loans to the public sector, long-term investment to industry and handicrafts and support for ailing industries.
Agriculture and housing also account for as much as 30 per cent of total loans to the private sector provided by the SCIs, while investment banks such as the Hellenic Industrial Development Bank have played a disappointing small role in the creation of new internationally competitive businesses.

At the same time, Greece does not have an effective capital market. Issues of securities accounted for only about 25 per cent of finance to the private sector over the last decade and only very few companies are listed on the Athens Stock Exchange.

Not least, the interest rate structure is not determined by the market but by administrative decision and aimed essentially at providing subsidies and incentives for priority sectors laid down by the Government.
Though reforms are being gradually implemented, notably by reducing the large number of interest rates, narrowing their differentials and raising the whole range of rates in real terms, Greece still has a long way to go before its financial system can equal that of other Western European nations.

The hope is that the long-delayed structural reforms will be required to make Greece a competitive economy. The pro-Moscow Communist Party of Greece (KKE) is in a slow decline, while the small Eurocommunist

### The outlook for 1986

Percentage changes in economic indicators

	1985	1986
Private consumption	1	-4
Government consumption	4	-2
Fixed investment	1	-2
Total domestic demand	1	-2
Exports	1	2
Imports	5	2
GDP	1	0
GNP	1	0
Manufacturing output	1	-1
Total employment	1	1
Unemployment rate	1	1
Implicit price deflators:		
Private consumption	1	1
Government consumption	1	1
GDP market price	1	1

Trade balance (billions of dollars)

	1985	1986
Invisible balance	-2.3	2.2
Current account balance	-3.9	-1.8

General government net borrowing (deficit) (per cent of GDP)

	1985	1986
	(12.3)	(10.0)

Sources: OECD estimates.

### Employment comparisons

% by sector of activity	Greece	EEC-10
Agriculture	30.0	7.5
Industry	27.1	25.8
Services	42.9	56.8

### Inflation rate (percentages)

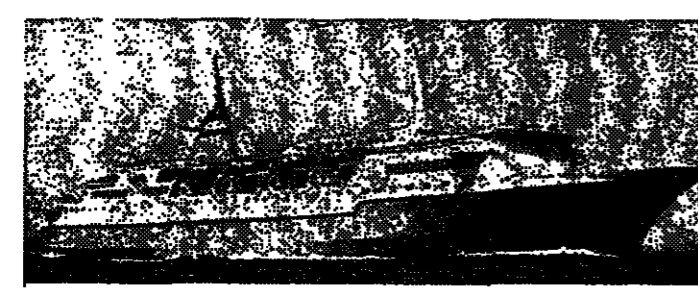
	1980	EEC-10	Greece
1980	14.1	8.5	
1981	12.3	3.1	34.5
1982	10.1	3.1	
1983	7.5	2.6	26.2
1984	6.3	2.4	
1985 (Nov)	5.1	2.7	

Sources: Eurostat.

# Economic U-turn

Party lacks a convincing government platform. One or two small splinter parties, formed from PASOK and New Democracy, have failed to make much of a mark. Among Greeks who are disillusioned with PASOK, the sense of having arrived at a political dead-end is strong.
For the time being, the Government is concentrating on gear-up for municipal elections next October. The Socialists do not have to face general elections until 1989. Much could happen by then to change the political scene.
Speculation in Athens includes a possible move by Dr Papandreu to the presidency. The splitting up of either or both PASOK and New Democracy into hardline and moderate factions and the emergence of a new centre force, and the convergence of the two Communist parties. Athens has not yet seen the last changes of direction.

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## Moves to modernise the system

Banking ANDRIANA IERODIACONU
THE GREEK banking system is nothing if not idiosyncratic. Dominated by state-controlled banks, which cover about 80 per cent of the market—about eight Greek private banks and some 30 foreign banks—the system is a hodge-podge of antiquated and complex system of reserve requirements and regulated interest rates which are negative relative to double-digit inflation. Much better than the EEC average, it little resembles banking in most other Community countries.

Over the past three years the Bank of Greece has taken some pioneering, if limited steps, towards deregulation. The web of dozens of lending rates governing every corner of the type of activity—there was a special rate for four mills for example—has been consolidated to four basic, maximum, rates: 21.5 per cent for working capital, 15 per cent for long-term investment, 16 per cent for agriculture and 17 per cent for small businesses and housing.

Case by case control of lending by the Bank of Greece has been relaxed, and banks encouraged to take their own decisions for the first time, on "business criteria"—on whom to lend, or not to lend, or within the above four broad lending categories.

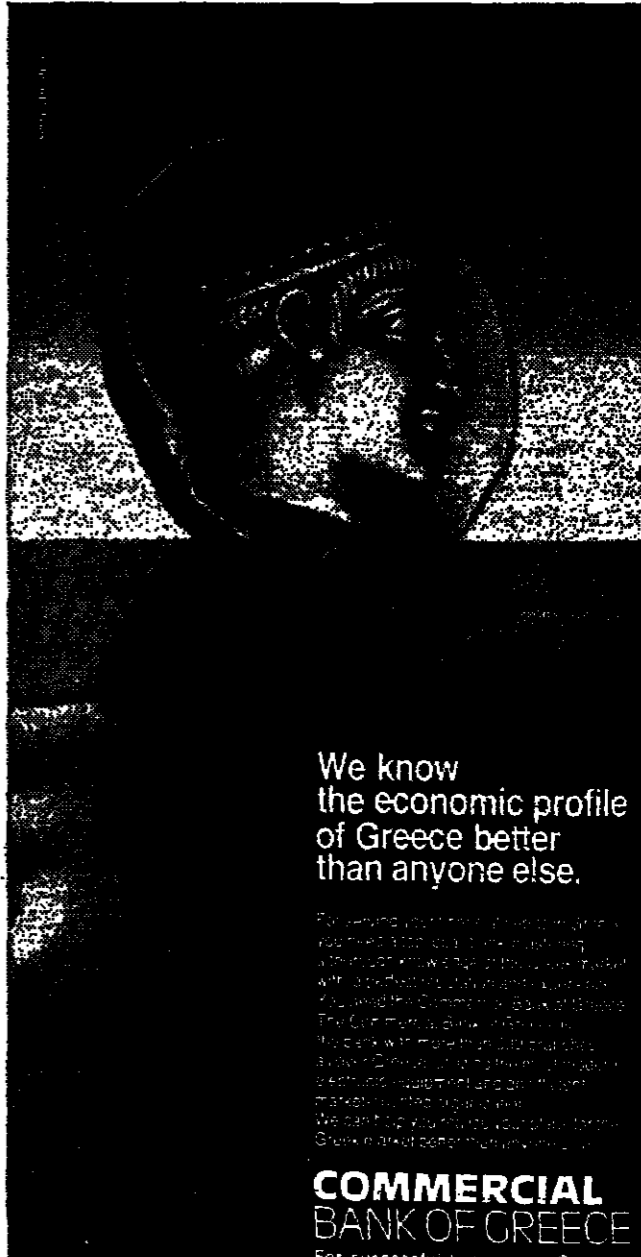
Central bank officials admit, however, that they are now in a dilemma. On the one hand deregulation has not gone nearly far enough, either in terms of bringing Greece's banking system closer to that of other developed western countries, or in terms of what private Greek and foreign banks want to see.
"We're grateful for the consolidation of interest rates, but that was a long time ago, and meanwhile 70 per cent to 80 per cent of all our deposits are still on reserve with the Bank of Greece," says a foreign banker.

political problems. A plan to introduce a unified computer system and through that a network of automatic teller machines in the state bank sector has been abandoned as too expensive.
On the other hand, forward-looking directors of state banks considering co-operation in this field with private Greek or foreign banks have thought about the automatic teller machines of working with "capitalists." The Greek public for its part remains suspicious of cheques, considering them much less safe than banknotes.

"If anything, we'll just have to bypass the era of the cheque and go straight into electronic money," says one Bank of Greece official.
Apart from the problems of bringing the banking system up to date, a serious shadow is cast by bad industrial loans of billions of drachmas granted during the boom years of the 1960s and 1970s to enterprises which are now financially ailing. The Socialist Government has taken over the management of several dozen such "problematic industries," with debts totalling about \$50bn to Greek and foreign banks, and private creditors, as the first step in a rescue programme. About Dr 170bn alone are owed to the National Bank of Greece, the giant of the state sector with about 80 per cent of the market.

Rescue plans
Interest payments to foreign banks are reportedly being kept up while the government decides on how to proceed with the rescue, but not so to the state banks—which, however, continue to show their payments as assets on their books.

"We are the only country in the world where banks always show profits and where no bank has ever gone under. You could say the Greek banking system is something of an accounting fiasco," admits one banker ruefully.
Under the economic austerity measures introduced by the Government in October, bankers say they expect a decline in deposits which began at that time to continue in 1986. At the same time they say they expect investment activity to remain flat, despite the Government's hopes of a revival in business confidence.
On the plus side, the tight incomes policy for 1986 and 1987 will help keep down personal savings, which have on average doubled over the past four years of relaxed wage rules—although foreign bankers in particular complain of a negative side of the coin, in not being able to offer com-



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GREECE 3

Friends and foes on their toes

Foreign Affairs ROBERT MAUTHNER

THE LEAST that can be said about Greek foreign policy under Mr Andreas Papandreu and his PASOK Government is that it has kept both friend and foe on their toes. Since first coming to power in 1981, the Government has shaken its allies by its hostility to NATO...



Mrs Margaret Thatcher, Britain's Prime Minister, with Dr Papandreu, whose foreign policy appears to have taken a more realistic turn since last summer.

If Mr Papandreu's bark has usually proved to be worse than his bite and his foreign policy posture has become markedly less aggressive towards the West since PASOK's election victory last year, there is always a risk of a relapse as the result of internal political pressures.

Suspicion

PASOK's Socialist ideological leanings, which often make the Government adopt an excessively tolerant attitude towards the Soviet Union and its allies, while treating the US and the West in general with extreme suspicion, have sown deeper roots in Greece than just the Marxist manuals.

April 1987 and ruled the country until 1974. It was hardly surprising, therefore, that there should be a backlash following the overthrow of the Colonels regime which was fully exploited by Mr Papandreu and his party. PASOK produced a steady cocktail by mixing its radical ideology with popular conceptions about Greece's betrayal by the West and the heightened nationalism resulting from the Turkish invasion of Cyprus.

Mr Papandreu's philosophy of the immediate post-junta period was summed up in the following statement: "It has become clear to the Greek people that popular sovereignty cannot be conceived outside the realm of national independence. This is why Greece's disengagement from Nato and the US constitutes the first and immediate aim of our movement. Our national independence is the precondition for popular sovereignty."

Gaule in France during the post-war period, Mr Papandreu's aim has been to restore his nation's pride and self-confidence by adopting a highly ideological stand in international affairs and by attempting to break the embarrassing "patron-client" relationship with the US.

Many believe that he could have achieved the same result without breaking so many ties with the West and without the constant contradictions and about-turns that have marked Greek foreign policy. But such judgments tend to underestimate the very real domestic political pressures with which Mr Papandreu had to contend.

been the main reason for Mr Papandreu's discouraging habit of speaking with two voices—one aimed at moderate domestic and international opinion, the other at radical militants. When seen in this light, the Papandreu Government's reluctance to condemn the regime in Poland after the imposition of martial law, its warm support for Soviet nuclear disarmament policy, its endorsement of the plan for a Balkan nuclear-free zone and its astonishing refusal to condemn the shooting down by the Soviet Union of a Korean jumbo jet in 1983, do not appear quite so perverse. Political expediency, especially in Greece, has its own rules.

There are several reasons why, since PASOK's re-election last summer, Mr Papandreu's foreign policy appears to have become more realistic.

One of the most important considerations has been the country's economic plight, which will absorb most of the Government's energies during the next two years and require as much foreign financial aid as can be mustered. Greece desperately needs both the loans provided by the EEC and the \$600m annual military aid given by the US for the modernisation of its forces, an essential requirement for an effective defence against the perceived threat from Turkey.

Last but not least, the US, which has not always in the past reacted as sharply as it might to Mr Papandreu's whims, has latterly shown its teeth, to the great discomfort—not to say surprise—of the Greek Government. The Reagan administration's "travel advisory" warning Americans not to go to Greece, issued last summer after the hijacking of a TWA airliner to Beirut—the result, it was alleged by Washington, of lax security arrangements at Athens airport—has had a dramatic impact on Greece's tourist earnings.

All this goes to show that Greece cannot afford to alienate the US too much and that Mr Papandreu will probably try to find an accommodation with the US on the bases, possibly involving the closure of only one of them on the outskirts of Athens, which will satisfy both Washington and his PASOK supporters.

Improvement

The recent approval by the US of the long-delayed sale of 40 F-16 fighter aircraft to Greece certainly foreshadows a happier bilateral relationship between the two countries. But whether the expected improvement extends to Greece's relationship with the NATO alliance as a whole depends entirely on the breaking of the deadlock in Greek-Turkish relations.

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The Greeks believe they have played the Community game with skill and guile in the past five years. Greece urgently needs EEC loans.

Love-hate relationship

Attitudes to the EEC QUENTIN PEEL AND ROBERT MAUTHNER

THE PASOK Government's progressive change of mind about the desirability of EEC membership has nothing fortuitous about it. If Mr Papandreu could tell the Greek Parliament last December that Greece's withdrawal from the Community would be "catastrophic," that judgment was based firmly on his evaluation of the national interest rather than a conversion to the ideology of European unity.

Convinced with reason that Greece's backward economy could not, for the moment, face the competition of its more advanced European partners, Mr Papandreu and his Ministers have been open to Europeanism as much by the sweet sound of the Brussels cash register as by anything else.

The semantic argument may never be settled, but in practice, the Greek interpretation appears to be in the process of implementation rather more rapidly than the northern definition. Net transfers to Greece from the Community's coffers hit the Ecu 1bn mark in 1985 and the so-called Integrated Mediterranean Programmes (Imps), the agreement on a Ecu 1.75bn balance of payments loan for Greece, and planned reforms to the Treaty of Rome.

The enlargement of the Community from 10 members to 12 on January 1 means at the most basic level that Greece is no longer the most junior member with the most immediate problems of transition to be overcome. More importantly, it will mean a real strengthening of the southern, Mediterranean lobby in the Community.

Similarly, though not dependent on the parliamentary support of the KKE pro-Moscow Communist party, he has gone out of his way to keep the Communists reasonably happy on foreign policy issues to prevent them from disrupting the economy by industrial strikes. The dual requirement of conducting a realistic foreign policy while keeping the radical left from rising up in protest has

have an important effect on the love-hate relationship: the accession of Spain and Portugal; the establishment of the Integrated Mediterranean Programmes (Imps); the agreement on a Ecu 1.75bn balance of payments loan for Greece; and planned reforms to the Treaty of Rome.

As Athens has sought to ensure. But it does give the member states a commitment to reorganise their social and regional funds with a clearer focus on the problems of the most backward regions. Certainly, Greece's dependence on such an exercise.

What should produce more immediate cash benefits is the deal finalised last March to put some Ecu 6.6bn over seven years into the backpockets of the Mediterranean through the Imps, Greece in particular is guaranteed Ecu 2bn.

Solution

For Greece, the deal was important because it spared the Government the politically unpopular task of turning to the IMF for cash. It showed that the EEC could be a really valuable partner in times of difficulty.

On the negative side, from the Communist point of view, Greece was granted yet another delay in introducing value added tax (in addition to the two-year extension granted from January 1, 1984).

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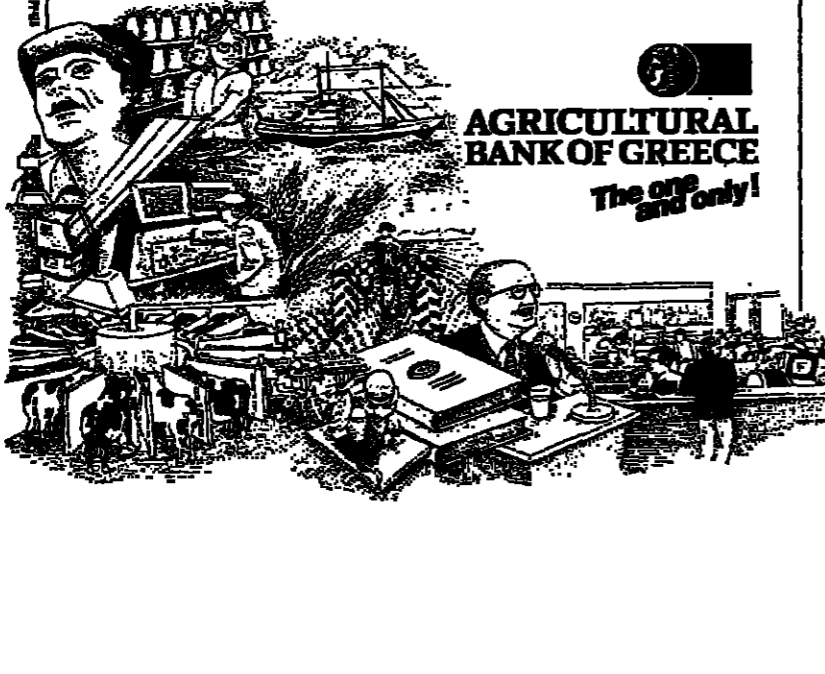
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GREECE 4

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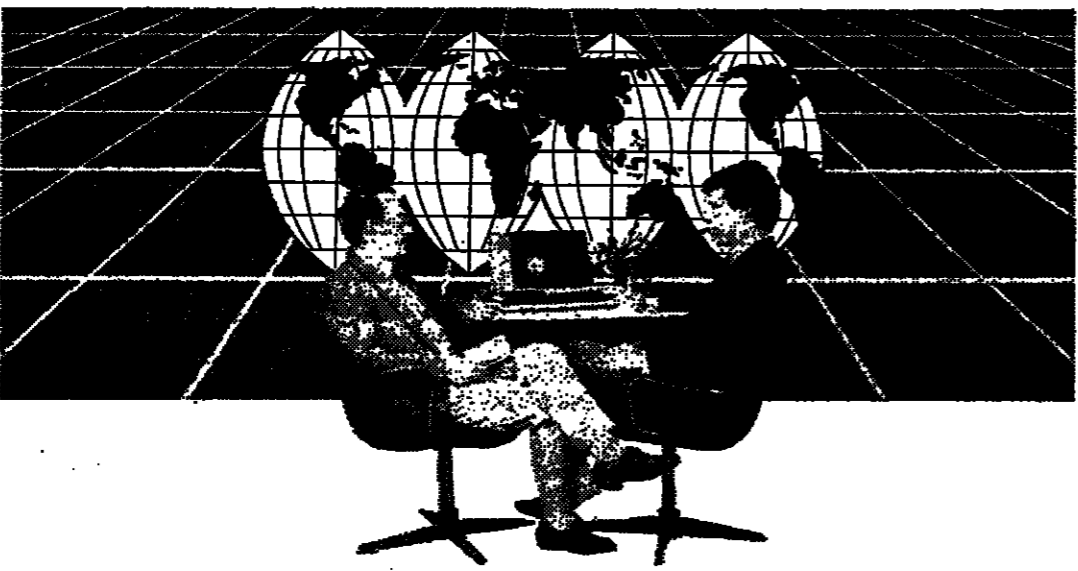


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Competitiveness remains elusive

Industry ANDRIANA IERODIACONOU

AN ATMOSPHERE of restlessness pervades the ranks of Greek industrialists as they see as Government failure to carry forward measures needed to boost the competitiveness of the country's manufacturing sector.

incomes policy imposed to the end of 1987 was welcomed too both because it would slow down the increase in labour costs—the labour cost per unit of production has tripled since 1982—and as a step towards combating double-digit inflation rates, three to four times higher than the European Community average.

to IOBE. Hardest-hit sectors include all construction-related materials and shipbuilding; textiles and leather are among those expected to be most affected by Spanish and Portuguese accession to the Community.

PROFILE: HELLENIC AEROSPACE INDUSTRY

Holding its own in export markets

"A MODERN aircraft is a high-technology microcosm: hydraulics, metals, electronics, composites, it's all there and it's all state-of-the-art, we could feed badly need technological know-how in a wide range of areas to the whole of Greek industry," says Mr Panayiotis Fotilas, managing director of the Hellenic Aerospace Industry (HAI).

Big boost for farmers

Agriculture ANDRIANA IERODIACONOU

GREEK FARMERS have never had it so good. As Dr Andreas Papandreu, the Prime Minister, stressed with some pride in Parliament recently, incomes in the farming sector have gone up by about 12.7 per cent in real terms since 1981, the year which saw both Greece's accession to the European Economic Community and the coming to power for the first time of the Socialist Party.

from about 2.5 per cent in the 1970s, to about -1 per cent. This partly reflects structural problems. Just under half of Greece's arable land is classified as mountainous or semi-mountainous, and only 29 per cent is irrigated. Holdings tend to be scattered and much smaller than the EEC average.

deficit of Dr 10.558bn in the first year of accession which virtually doubled in 1982. The trend was reversed in 1983 and 1984, with the deficit trimmed to Dr 5.906bn at the end of the latter year. However, national statistical service figures for the first six months of 1985 show an alarming turnaround, with a January to July deficit of Dr 21.4bn compared to Dr 2.1bn in the same period the previous year.

Ship-owners hit hard

Shipping ANDREW FISHER

IT HAS been the deepest and longest slump in living memory. Throughout the 1980s, world shipping has suffered acutely from the heavy surplus of tonnage in key sectors of the industry and there are no signs of an early end to the distress.

So the industry has requested a two-year freeze on tax rises and the restoration of the law aimed at saving on crew costs by reducing manning by two or three people and lifting the proportion of foreign crew members from 25 to 30 per cent. This legislation expired in October.

ship programme, building up services between the US, Mediterranean, Middle East and Asia. But its demise was not the end of the presence in shipping of Princeton-educated Mr Callimacopoulos. His bulk shipping and tanker company, Trade and Transport, was unaffected.

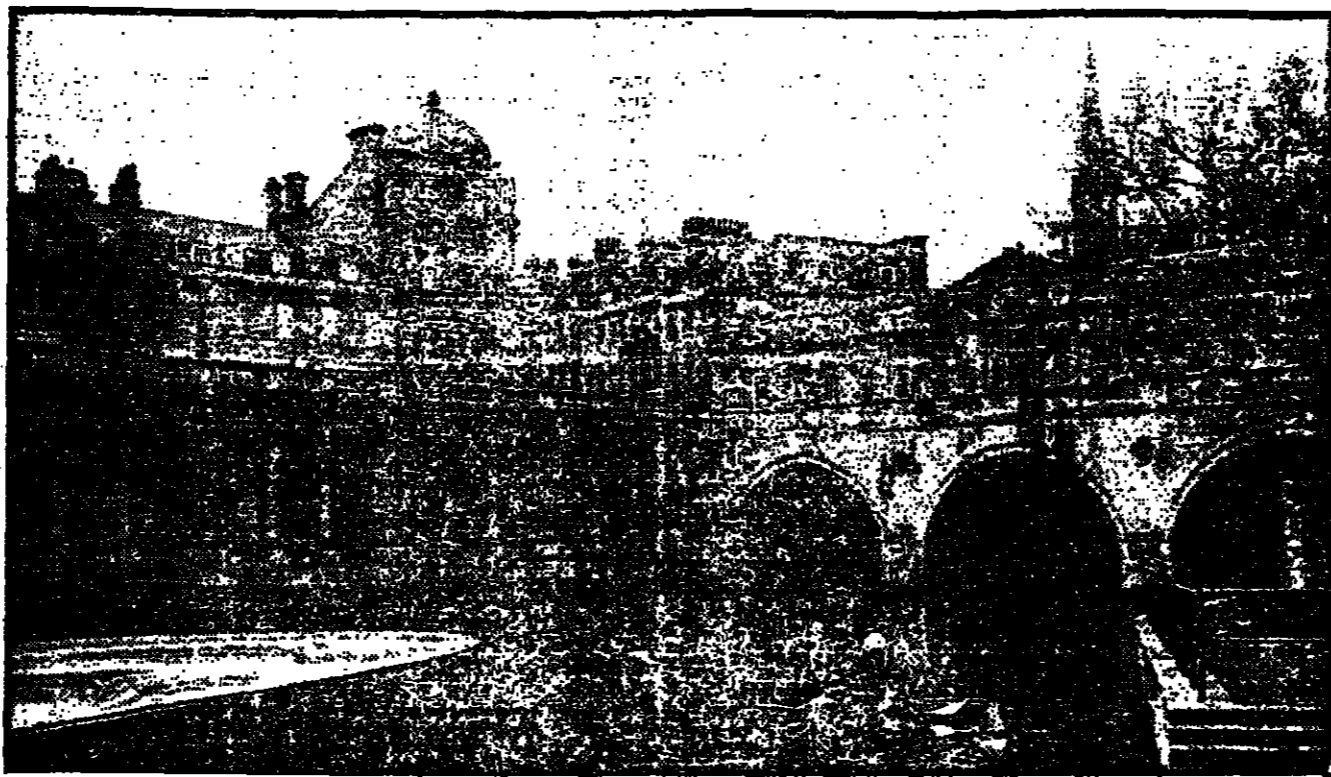
both for the United States Air Force in Europe and, under a five-year, US\$8.5m contract signed in 1983, for Britain's Royal Air Force. "We're particularly proud of this contract, both because it's the first time the RAF farms out a job of this kind and because we secured it against tough European competition," says Mr Fotilas.



Architecture/Colin Amery

Chronic uncertainty in Bath

There is no doubt that the British are far too cavalier and unconcerned about their architectural heritage. Although there has been some improvement on the appalling days in the 1960s, when the fatal combination of planners and developers set about destroying as many town centres as possible, there are still worrying lapses and no signs of emergence of informed public opinion that will fight for an improvement in architectural standards. ... The City of Bath in what was Somerset and now endures the name of Avon is a good example. Bath is a city of such architectural distinction and quality that it ranks as a place of European importance...



Pulteney Bridge and Weir, Bath—"superb exercise in classical politeness"

so makes some rather obscure groupings towards classical elements. Arched windows on the library and a wobbly colonnade on Northgate Street with some tentative oil-de-bois windows are more gestures towards a style. Bath is still a coherent, mellow, residential city with a strong classical tradition. This crucial site at its heart demands the highest architectural standards. The city fathers, if they are up to it should demand the removal of eyesores that have ruined Bath and should commission someone of quality like Leon Krier to prepare an urban/architectural plan for the whole city. ... The two John Woods, who made Bath, would understand that the city needs a grand and thorough reappraisal—on visual grounds. It is possible for Bath to commission a new plan and a new programme of gradual development that would make the city more beautiful, that would understand the references of the classical past and would see the point of making Bath the new Arcadia of the 21st century.

The Magic Flute/Coliseum

Max Loppert

Jonathan Miller's first-ever vocal, and theatrical distinction. In Glasgow, Benjamin Luxon's West Country Papageno had created a reliable point of light amid the encircling pallor; at the Coliseum he gives a no less extraordinary one—the 1790s dream of the triumph of Enlightenment over the dark forces of Church and State that comes to a young schoolboy who is wedded to (during the overture) in the massive, book-lined spaces of Philip Frowe's endlessly fascinating Bibliothèque Nationale setting.

As I wrote here after the 1983 Glasgow premiere, it is surely "one of the most thought-provoking visions of the opera that most of us will ever have had". Best advice same-time I couldn't help taking it as, for the most part, "a production of a sheet of erudite and highly subtle Magic Flute footnotes, rather than of the actual opera". Its coldness, overriding intellectual self-importance, most of all its apparent futility.

The new London presentation doesn't conclusively settle all those doubts and criticisms. It is hardly the Flute to persuade the widest possible audience that this is one of the most physically enthralling. Trials by fire and water are scrapped; moments of naive delight provided by chimes, waterfalls, and animals (there is continuity with those of Anthony Bonello's sadly missed ENO Flute) are made rigorously "grown-up". Either Miller deprecates Mozart's sense of child-like wonder, or else he simply lacks it. Yet for all that, Friday's show provided many a rife and gaudy pleasure. Whereas the Glasgow premiere had been a rather frosty, tentative occasion, slightly played and moody under-sung, in London there was pure success a happy blend of musical,

Fast/Covent Garden

Max Loppert



Susan Bullock

extremely musical conducting. On Friday the dialogue with the Orator (Norman Bailey) went dull, more sermon than dramatic; cross-cut accompanied recitative, but for the rest the gentle sureness of the musical direction proved to be exactly what this production needs.

Comparisons are unfair and unkind, everyone knows, but sometimes the need to make them becomes overwhelming. Thursday's Royal Opera revival of Gounod's Faust was one of those occasions. In itself it proved to be a very middling "house showing" of what was, even in its original estate (in 1974), a notably unimpressive production; but following as it did the recent English National Opera Faust, it was made to seem twice as dreary and purposeless as it might otherwise have done.

The ENO, after all, had given a brilliantly engaging and sparky new look to the whole piece (including its performing edition). At Covent Garden one was therefore to be that much harder on something as patently and routinely old-look as this—Michael Rynnison, taking over John Copley's staging, is supposed to have revised the production (and settings) in the last two acts, but his effect was minimally helpful, when not simply imperceptible. The supposed special advantage of the Royal Opera system is its provision of singers of "international excellence." On Thursday, with a roster containing a Welsh

South Bank Board's 'adequate subsidy'

The South Bank Board, which takes control of London's arts complex on the Thames on 1.1.86, has received from the Arts Council most of the money it asked for. Mr Ronald Grierson, chairman of the board, said in October that he would need £8.5m a year to run the complex and another £2m for maintenance work. The Arts Council is likely to announce later this month that the South Bank will receive just over £8m for administration in 1986-87, but less than £1m towards the planned refurbishment programme. The money should ensure that the new management gets off to a good start. The G.L.C. has allowed the South Bank Board £1.5m to develop the Queen Elizabeth Hall and the Purcell Room only in the last few weeks, but the figures proved a pleasant surprise and slightly less than the board had expected. The board also thinks that maintenance work on a new heating and ventilation system for the Festival Hall is not as crucial as was feared so that it can survive on less than requested. The board plans to complete in three months an assessment of maintenance expenses over the next three years in the hope of squeezing more long-term cash from the Arts Council. The South Bank Board is financed only to maintain the status quo. Its plans to improve the gloomy, concrete atmosphere of the place depends on private funding. The ambitious Farrell Plan, which envisaged removing the overhead walkways and installing a translucent roof to unite the three concert halls, awaits an arts-loving business sponsor (Sainsbury?) although there are hopes that, in a year's time, a start will have been made on knocking down the worst of the walkways and installing a roof to cover the entrances to the three halls. The public should expect no immediate changes on the South Bank from April. The Festival Hall is booked solid for the next two years with a programme little different from its traditional format of mainly orchestral concerts. But the two smaller halls have many dates, and Mr Nicholas Snowman, the artistic director, is looking at ways of introducing more exciting programmes based around themes and festivals. The South Bank Board has limited resources for promoting its activities, although it will continue with the G.L.C.'s innovations such as Thames Day and the Summer Festival. Its first promotion takes place at the Festival Hall on May 3 when it will hold a celebratory concert to commemorate the 35th anniversary of the hall. It has the goodwill of its neighbours on the South Bank—in the National Theatre, the National Film Theatre, and the quickly developing Museum of the Modern Image, plus the four big orchestras—which support its plans to bring more cohesion and synergy to the activities that resound there every night. The achievement of the South Bank Board in ensuring adequate subsidy means more problems for the Arts Council in its task of distributing £25m of government money between the elements of the disappearing Arts Council. The Government may have given the Arts Council £2m more than it originally proposed but the sum is still £10m less than the council needed. Hence the row over Sadler's Wells and the other "receiving" theatres. They did not in the past receive Arts Council cash, and the council is reluctant to take on expensive new clients when its policy is to decentralise its activities to regional arts associations and give to the new and promising at the expense of the old and mundane. The Arts Council hopes that a show business millionaire will buy Sadler's Wells with its great name and solve the crisis. It has been unsuccessful in its search for a successor in other parts of the country, hoping that they will increase their aid for the arts.

Antony Thornecroft

The Happy Haven/Leeds

Charlotte Keatley

The Happy Haven by John Arden has received only three professional productions since its premiere at the Royal Court in 1960. In John Harrison's revival at the Leeds Playhouse, a young cast convert the playing of octogenarians into a convention; half masks are worn by all the inmates of Dr Copperthwaite's surplus old folks home. The paradox of young cast and old characters is also central to the theme of the play; the old age is examined as a conceptual, rather than a stereotypical, phenomenon. Dr Copperthwaite is experimenting through the alibi of life and youth to turn the clock back on his patients and offer them a "future" which is actually their past. Why then does John Harrison cast the not so young at the very old and lose the irony? Arden was, characteristically, experimenting with a paradoxical relationship with the audience. The script ransacks Comedia dell'arte and includes rhythm song and riddles, and specifies a formalised performance style, white being shot through with attacks on the Welfare State and Ministerial ineptitude, all of which invites a Dario Fo breakneck treatment. Timothy Davis recognises this and plays Copperthwaite as Faustian crossed with John Cleese: a waist-coated sonorous pedagogue whose staring-eyed obsession with his elixir turns a lead solo role into a monomaniacal party piece. The rest of the production looks like an afternoon tea-party in a dolls' house. The design provides a two dimensional procession of painting with scientific instruments, time pieces in steps and beige and a vaguely Baroque mansion backdrop for scenes requiring a laboratory. The patients' masks are chunky cheeked, blue eyed and unwrinkled images of old age; the costumes reflect contemporary realism in drab colours. Dr Copperthwaite's attendant nurses and orderly are starchy but not menacing enough. There are no visual representations of the extremes of human malice and vulnerability which exist in the script to make this play potentially as truly riotously funny and grotesquely sharp.

Blithe Spirit/Vaudeville

Michael Coveney

Theatre historians regularly assert that Noël Coward's fame is safe with Private Lives and Blithe Spirit. The former candidate meets with general approval, the latter with a few sniffs and quibbles and submissions of Hoy Ferer and Present Laughter. The historians have an ally at the Vaudeville in this first class, bright, intelligent and thoroughly enjoyable revival of a piece Coward wrote ostensibly to cheer up London in the dark days of 1941 but which even he paused to consider, jealously, as possibly "important". Not even in 1941 could such an exchange as "Anything interesting in The Times?" "Don't be silly, Charles" have been received more enthusiastically. But chance relevance of witticism is secondary to the success of the comedy as a beautifully organised structure in which Charles Condomine, a middle-aged novelist, invites Madame Arcati, an eccentric medium, to dinner with his second wife only to be tormented by the corporeal ghost of his first. Although he is alleged to have knocked the glass off it, you can see all too easily why Harold Pinter directed the play at the National some years ago. This own Old Times is a variation on similar themes: different versions of the same relationship, the distorting tricks of memory in recriminatory conversation, a murder, a setting of a hothouse limbo where fantasy and hallucination play tricks with real time, a suspension of all social responsibilities. Peter Farago's production preserves perfectly that blend of humour and absurdity in the

Arts news in brief

The National Theatre has won five of the ten awards given by Drama Magazine. Alan Ayckbourn's A Chorus of Disapproval was voted best new play; William Dudley, best designer for The Mysteries and The Real Inspector Hound; The Critic (as well as for the ENO's The Merry Wives of Windsor and Mutiny!); Imelda Staunton, best supporting actress for her work in the Ayckbourn as well as in Old Vic The Corn is Green; designer Tim Goodchild, the musical director William Blezard. Richard Ormond, 46, has been appointed director of the National Maritime Museum in Greenwich, London. He joined the museum in 1983 and is at present head of the gallery's pictures department and curator of the Armada Exhibition planned for 1988. He will take up his new appointment on March 10, replacing Dr Neil Cossons.

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Arts Guide Music LONDON Cleveland Orchestra, conducted by Christoph von Dohnanyi... PARIS Birmingham Symphony Orchestra, conducted by Simon Rattle... WEST GERMANY Munich, Herkulesaal der Residenz... NETHERLANDS Netherlands Bach Society choir and baroque orchestra under Jos van Veldhoven...

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Foreign Affairs

The case of the tongue-tied strategists

By Ian Davidson



Some key dates

- March 11 1985—Mikhail Gorbachev succeeds Konstantin Chernenko as General Secretary of the CPSU
Sept 9 1985—Gorbachev interview in Time Magazine
Aug 6 1985—Gorbachev starts moratorium on nuclear testing until year-end
Oct 3 1985—in Paris France offers a 50 per cent cut in strategic nuclear weapons, and a separate deal on Euro-missiles
Nov 19-20 1985—Gorbachev-Reagan summit in Geneva agrees the principle of a 50 per cent cut and an interim Euro-missile deal
Jan 15 1986—Gorbachev proposes total, world-wide nuclear disarmament by the year 2000.

Lombard The DoE blows its own gaff

By Anthony Harris

SUPPOSE for a moment that despite the total scepticism of nearly everyone in the British Cabinet, apart from Mrs Thatcher herself, and the deeply-felt opposition of the Treasury, the Baker Green Paper on abolishing local rates was put into practice. What would its effect be? The answer is given in the Green Paper; half of it has been widely publicised, but the other half has received almost no attention. Put the two together, and you will find a rare example of a Government department blowing not its own trumpet, but its own gaff. To judge by one or two conversations with officials, it is unlikely that this is an accident.

The well-known half of the answer is that there will be 10m winners and 10m losers from the change; this is already enough to frighten any but the greenest MP, who knows that hard cases make adverse swings.

Upside-down This simple analysis also goes far to explain why the Treasury are such keen defenders of property taxes. All you need do is to turn the DoE's analysis upside down. The DoE shows that relief from a property tax gives a once-for-all capital windfall to existing owners, but only a transient income benefit. It is equally true that the imposition of a new property tax imposes a once-for-all capital loss on existing owners, but only a transient loss of income. That is why so many wiser countries impose land taxes—and why the idea was approved in this country by a Royal Commission which reported in 1986. It would be nice to think that its advice would be acted on before its centenary.

Unfortunately, though, it is likely to die exactly the same death as Mr Baker's plan: for the transient losses would be immensely painful politically and the long-term benefits (notably much lower land prices) would emerge only later. The same analysis which shows that the idea is economically desirable shows that it is "politically impossible." Not even the Liberals talk about site value rating any more; yet here the cause really is workable.

parts of his grandiose, three-phase plan? It is obvious that he wants to stop President Reagan's Star Wars programme; and a Soviet proposal for complete nuclear disarmament by the end of the century looks at least like a good propaganda response to President Reagan's original claim that Star Wars would render nuclear weapons "imminent and obsolete." If there were no nuclear weapons, there would be no need for a defence against them. But we cannot at this stage assess which broad areas of the canvas are most propaganda and which are seriously meant as a basis for negotiations, whether now or later.

Perhaps a skeletal reminder of the Geneva scheme would be helpful. It falls into three phases, with several elements in each. Phase One: the next five to eight years. A 50 per cent cut in US-Soviet strategic weapons, with a ceiling of 6,000 warheads each. The elimination of all US-Soviet ICBMs in Europe. Britain and France renounce any nuclear build-up, and the US renounces any transfer of strategic or medium-range missiles to other countries. US-Soviet ban on nuclear testing.

Phase Two: 1990—for five to seven years. Other countries join the nuclear disarmament process, with a 50 per cent cut in US and Soviet Union con-

Mr Gorbachev seemed as if he meant it. The Americans, by contrast, had painted themselves into the awkwardly negative position of protesting that they would never give up their Star Wars programme. In other words, in negotiating as well as in propaganda terms the Soviet Union already held the high ground, and the Reagan administration did not appear to know how to react to it, or even whether to try. Why has Moscow now upped the ante in ways which raise questions about its seriousness?

At least three possible explanations suggest themselves. In the first place, Moscow may be having second thoughts about the deep cuts in strategic nuclear weapons which it proposed last year: complete nuclear disarmament sounds even more virtuous, but the engagement of the agenda could confuse and slow down the negotiating process in Geneva. This would be a remarkable volte-face; but Mikhail Gorbachev has been so hyper-active on the international stage in his 300 days in power that surprises have ceased to be entirely surprising.

On the other hand, the corollary of such a backing-off would be a lower priority for the quest to curb President Reagan's Star Wars; and this would be not just surprising, but implausible. We have the Russians as we want to see them: they believe in Reagan's dream of a perfect defence against nuclear missiles, but because they fear the dangerous instability and the vast economic drain of such a defence, they are not ready to accept it. The odds must be that Mr Gorbachev is still con-

mitted to the kind of deep cuts which might force President Reagan to do a deal over Star Wars. The second hypothesis is that Mr Gorbachev's new plan is meant to be taken seriously and not literally: this is not a blueprint for negotiation, but a political gesture the significance of which lies more in the direction of movement than in the result at the end of the road. A 50 per cent cut in strategic nuclear weapons would sound, and on the historical record would be, dramatic; but it would still leave the two superpowers with vast overkill in nuclear weapons, with many of the old grounds for fear and suspicion. The implied premise of the Gorbachev proposals, unstated but essential, is that the political relationship between the two superpowers can be entirely different from the frost which marked 1979-84 and its transformation can be cemented by a process of arms control negotiation stretching far into the future.

There seems little doubt that Mr Gorbachev does want a better relationship with the US, and he needs it for the sake of the revival and reform of the domestic Soviet economy. He may even be prepared to accommodate American sensitivities in the Third World, though he can scarcely be expected to make any meaningful or binding promises on that score. But arms control is susceptible to negotiation, and may be the most powerful lever for reviving a form of détente. Even if there is something in this hypothesis, it is not incompatible with a third explanation: that in Mr Gorbachev's

Manufacturing industry

From Lord Kaldor Sir, in his article of January 29, Professor Maynard appears to suggest that the decline in UK manufacturing output was due to a world-wide phenomenon precipitated by the 1973-1980 oil price rise and in the case of the UK, aggravated by the discovery of North Sea oil. Since net exports of fuel represented some 2 per cent of GNP, it was inevitable that net exports of manufacturing should deteriorate by an equivalent amount if the overall balance of the current account were to be kept unchanged. This, however, says nothing about the consequences of these changes on the GNP as a whole.

The value added by the newly discovered oil is a net addition to our potential GNP and it does not justify any fall in manufacturing output, or indeed in any other category of production. It certainly cannot justify the fall of manufacturing output by 17 per cent between the second quarter of 1979 and 1981, and the rise in unemployment by 3m between 1979 and 1984. If as a result of the consequences of our oil exports our net manufacturing exports are reduced, it is the Government to expand domestic consumption and investment so as to maintain actual output at a level which is not below the potential. It was not the UK's manufacturing deficit "which mattered" but the fact that manufacturing output, together with employment, had sharply fallen and our GNP as a whole was reduced at a time when the manufacturing output of other members of the Organisation for Economic Co-operation and Development (OECD) was increasing or at least maintained. It is possible to maintain a course that 3m unemployed was a necessary price for obtaining the high exchange rate as an instrument for fighting inflation.

The really unfortunate fact was that North Sea oil and Mrs Thatcher came on stream at the same time and this caused our situation to become aggravated by higher taxation and higher interest rates just when the addition to our potential GNP made by North Sea oil called for the very opposite of these policies. Nicholas Kaldor, House of Lords, SW1

Difficult tap to turn on

From the Secretary, Institution of Production Engineers. Sir, The article by Geoffrey Maynard "The UK's manufacturing deficit doesn't matter"

Letters to the Editor

(January 29) cannot be allowed to pass without comment. I am sure the author is an expert in the field of economics, but I am not so sure of his credentials when it comes to the exports of manufacturing industry. He is falling into the usual trap when he states "the widespread fear that the UK no longer has the manufacturing capacity to fill the gap left by oil is probably overdone." The fact is that manufacturing industry needs people as well as investment. It takes about ten years to train a professional production engineer (a good deal longer than an economist). Moreover, the rate of change in manufacturing technology demands constant re-education by everyone in the profession. To imply that we simply turn on the manufacturing tap "in the long run" shows a lack of realism. R. J. Miskin, 82 Little Boiling Lane, W5.

Access to markets

From the National Secretary, Textile Group, Transport and General Workers Union. Sir—I was astounded to read your article in the Guardian of January 30 on the future of the Multi-Fibre Arrangement. Although you seem to take an Olympian view on trade liberalisation and the forthcoming GATT talks, you conveniently overlook a number of very important issues pertinent to the current re-negotiation of the MFA.

The MFA is officially recognised and its operations are monitored by the GATT authorities. It actually guarantees exports from the Third World growing access to our markets. You take no account of the United States position where President Reagan has quite clearly stated that the US trade representative is directed "to most aggressively re-negotiate the MFA on terms no less favourable than present." This presents a clear danger of trade diversion from the US to the EEC if our position is weak on the re-negotiation and the subsequent bilateral agreements. Most importantly, as in the case of the European Commission of our own UK Government, you take no account of the effect that a weak MFA would have on jobs in our industry. If the present EEC draft negotiated mandate is adopted at the next Council of Ministers meeting and becomes

Phasing out quotas

From the Directors, National Consumer Council. Sir, I very much welcome your timely leader "Time to phase out the MFA" (January 30). Consumer organisations in this country in the Common Market and indeed globally, fought the last round of the Multi-Fibre Arrangement and are fighting this one. Sadly, in spite of your leader, I fear that we shall be fighting the next. It is becoming clear that the MFA imposes enormous hidden costs, not only on British consumers, but also on the rest of business and on the economy as a whole. It is vital that our Government leads the EEC into a liberal negotiating position. Tinkering with the system, for instance by loosening a little the quotas on children's clothing, is nowhere near enough. The position that the EEC should be taking is that we spend the next round of the MFA phasing out quotas so that we never need them again. Jeremy Mitchell, 16 Queen Anne's Gate SW1.

That poll tax

From Mr J. de Rivaz Sir, The Government's intentions to spread the burden of local authority finance are admirable. As up to 75 per cent of such spending is on education, however, the ideas fall far short of the target. An easy answer would be to fund education from central government, via general taxation. Those, however, who perceive a practical difference between local and central government will complain at this. A logical but more complicated alternative would be

Unexploited vision

From Professor I. Aleksander Sir, in his otherwise excellent article (January 30) on computer vision systems in industry, Peter Marsh seems to have missed a salient point. He has drawn attention to the fact that human labour is fallible and therefore a significant percentage of assemblies go wrong and need to be detected through computer vision systems. The situation is a little more subtle. It is the automated process which can sometimes detect only cases of malfunction. Therefore the key issue which has made computer vision systems take off in the past year or so is that they hold promise where production planning becomes very difficult. It is difficult to foresee the sort of mis-assemblies that an automated plant will produce. It is therefore important that the vision systems which inspect the products are not too inflexible and it is this flexibility that distinguishes between products that are currently available on the market.

Peter Marsh has also referred to the "smallness" of British industry in this area. It is important to point out in connection with the flexibility mentioned above, that some beautifully flexible equipment is being manufactured in the UK. The problem with exploitation of this is the usual one: potential British users of vision should be prepared to experiment with these new forms of equipment to far greater an extent than has been done so far. After all, they are bound to be a winning track: the purchase of £80,000 worth of vision equipment can add value to a product of several orders of magnitude greater than the modest investment. Therein might lie a better explanation of the enthusiasm in the US motor industry for taking this direction. (Prof) I. Aleksander, Imperial College of Science and Technology, 180 Queen's Gate, SW7.

Letters to the Editor

for the poll tax to fall on everyone. An appropriate increase in child allowance could then be used to make taxpayers the ultimate provider of educational finance. John de Rivaz, West Town House, Portsmouth, Truro, Cornwall.

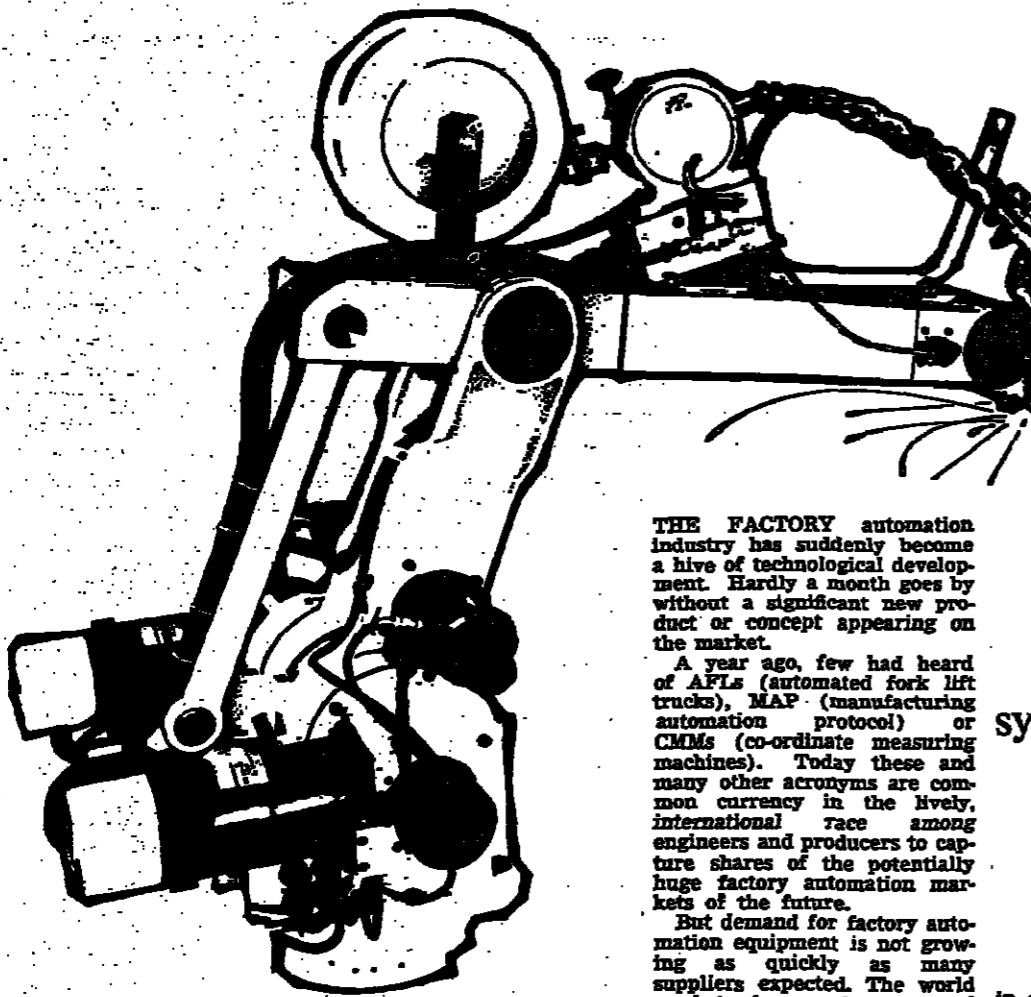


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# FINANCIAL TIMES SURVEY



## Manufacturing Automation

Technological development has opened the way to more flexible shopfloor automation. But the market for more ambitious integration systems has grown much more slowly than expected

### Robots travel slow road

By IAN RODGER

THE FACTORY automation industry has suddenly become a hive of technological development. Hardly a month goes by without a significant new product or concept appearing on the market.

A year ago, few had heard of AFLs (automated fork lift trucks), MAP (manufacturing automation protocol) or CMMs (co-ordinate measuring machines). Today these and many other acronyms are common currency in the lively, international race among engineers and producers to capture shares of the potentially huge factory automation markets of the future.

But demand for factory automation equipment is not growing as quickly as many suppliers expected. The world market for equipment and systems is about \$50bn, but forecasts of 25 per cent annual growth rates have been scaled down in the past two years because of sluggish sales in many sectors.

Some companies have been badly caught out by lack of growth. General Electric of the US geared up in 1982 to handle a surge of big contracts, but found that few were forthcoming. It has scaled down operations after suffering losses of \$120m in three years.

No one doubts that a boom in demand for automation equipment and systems will come and that computer integrated manufacturing (CIM) will become a reality. The factory is increasingly recognised as an important weapon in manufacturers' competitive strategy, and automation has a big role in maximising performance. But implementation is taking longer than some expected.

This is reminiscent of a similar period of disillusionment

in office automation more than a decade ago. In the 1960s, the emergence of mini-computers and technology enabling computers to be linked through telecommunications lines made possible the development of on-line management information (MIS).

Many starry-eyed growth forecasts were made. But by the early 1970s, it was clear that MIS schemes were very difficult to design and implement. Even today they are not widely used in corporate offices.

Similarly, the factory automation field has been jolted by big technological developments which, in turn, has led to some overly rosy forecasts of demand.

Until a few years ago, the potential applications of factory automation equipment were limited. The technology then available meant that automation equipment had to be tailor-made to produce only one type of product, and so could only be justified if that product was made in very large volume.

Automation projects to be applied only in the automotive and domestic appliance industries, and process industries such as chemicals and paper.

The emergence of low-cost programmable logic controllers (PLC) and computer numerical controls (CNC) in the late 1970s opened the way to more flexible automation on the shop floor. Automation equipment can now be easily re-programmed, enabling it to make a variety of products. Manufacturers that produce many things in small volumes — and they are the vast majority — can now contemplate some forms of automation.

This has given a big boost to demand for the most straightforward types of automation equipment, such as computer aided design systems (CAD), robots and CNC machine tools.

But the market for the more ambitious systems that integrate these and other machines under computer control has been much slower to develop. It is probably premature to talk of markets for advanced factory

automation systems: at this stage, both the suppliers and the potential customers are feeling their way.

On the supply side the push for CIM systems creates demands for other technologies to take over functions such as handling, assembling and inspection, that have required a lot of skilled labour up to now.

In the past year probably the most exciting developments have been in vision systems. The potential is enormous, especially in inspection and assembly, where they enable machines to identify parts and to verify their shape with 100 per cent reliability. One estimate suggests that by 1992 more than 40 per cent of inspection systems in manufacturing will have vision capabilities.

A plethora of new vision systems have come on the market. There are hundreds of companies in the US and Europe, many very small, offering solutions to problems of non-contact sensing, high-speed operation, dimensional accuracy

and the ability to examine small or restricted areas. Frost & Sullivan estimates that the European market for vision systems is worth \$190m and will be \$350m in 1989.

Heavy materials handling is another sector in rapid change. Automated guided vehicles (AGVs) are increasingly common in factories, but most are tied to fixed guidance systems such as wire rails buried in the floor. Some suppliers are developing free-ranging AGVs that will follow routes provided from computers.

Meanwhile, a big effort is being made to simplify electronic communication between the increasing variety of machines involved in factory automation. At the centre of this effort is MAP, the manufacturing automation protocol developed by General Motors of the US.

GM, which is one of the biggest spenders on automation equipment, hoped that if it required all suppliers to make MAP compatible equipment, MAP would become an industry standard.

The MAP initiative has already turned into a bandwagon, with such automation suppliers as Fanc of Japan and Gould, Digital Equipment, Honeywell and Hewlett-Packard of the US following GM. Last November, GM demonstrated a fully-automated manufacturing system for making toys, using equipment from 21 suppliers all joined by MAP.

All this activity is bewildering for potential customers and, to the dismay of the suppliers, most are keeping their hands in their pockets.

Continued on Page 8

### UK Engineering Industry

	% using AMT	Employees			
		Under 50	50-200	200-1,000	More than 1,000
Direct numerical control	Installed 12 Priority 17	16 19	10 14	15 14	15 20
Flexible manufacturing systems	Installed 8 Priority 16	3 9	10 18	14 22	16 27
Programmable logic controllers	Installed 12 Priority 6	12 7	10 6	19 6	17 11
Automated welding/joining	Installed 2 Priority 7	2 5	2 8	6 4	15 5
Other automated assembly	Installed 4 Priority 11	4 11	2 12	8 15	12 12
Automated product finishing	Installed 2 Priority 6	2 6	2 4	5 9	8 11
Automated testing	Installed 9 Priority 11	9 11	2 10	8 15	21 12
Automated materials handling	Installed 3 Priority 9	3 6	2 6	5 12	11 19

\* Computer users represent 57 per cent of UK engineering plants.  
Source: 1985 Engineering Computers Survey/DPL © Findlay Publications.

Contents	
	Page
Robotics: Tough time for adolescent industry	2
Profile: Fanc—Young company far ahead of the pack	
Small Batch Production: Linked success in low volumes	3
Profile: Jaguar/Dainichi Sykes — Islands of accuracy in tailored system	
Materials Handling: AGVs set free to wander	4
Profile: Jungheinrich—Late starter shoulders into market	
Inspection: Machines get the measure of quality	5
Profile: Intel—Image change sends revenue soaring	
Assembly: Bright prospect for small-timers	6
Profile: John Brown—Fits and starts by UK leader	
Manufacturing Automation Protocol: MAPs around factory floors lay paths to survival	
Profile: Hitachi Seiki—Flexible system profits demand intensive use	7
Profile: KTM — Joint ventures make up for weakness	
Profile Giddings & Lewis—Numerical controls help recovery	
Product Design and Engineering: Watershed for computer-aided industry	8
Profile: Warwick University—Face hotting up for pioneering centre	

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## Manufacturing Automation 2

# Tough for adolescent industry

### Robotics

JOHN DWYER

IT IS tough in industrial robots. The market shows less sign of maturity than of adolescence: growth has been uneven and in one or two cases the parents wish the robot offspring would find another home.

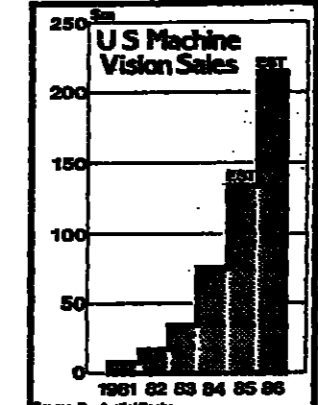
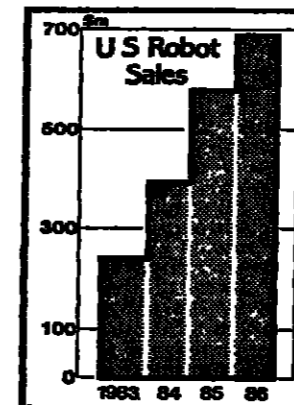
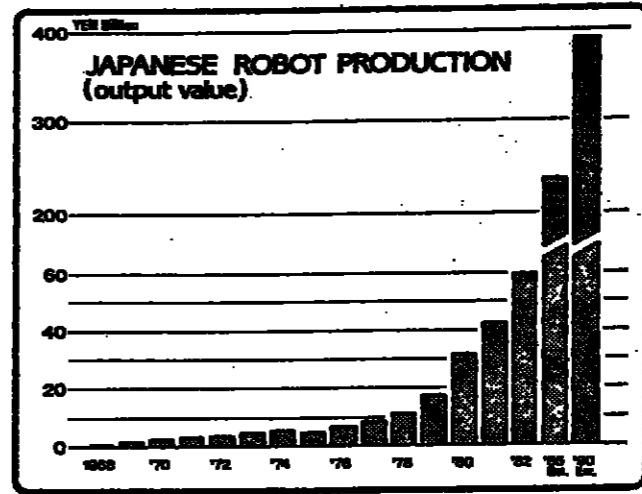
A sign of the times is Rediffusion's decision to float off its robot subsidiary. It had sold only 14 systems in three years against a commitment to its US partner, American Robot Corporation, to take 160 ARC machines over four years. Rediffusion Robots was making no money and, at least in terms of profits, even Unimation and Cincinnati are doing no better. Cincinnati's UK operations have now been combined with problematic machine-tool business.

One of the noisier of the bottom-end upstarts, Pender, backed by the Welsh Development Agency and SI, has gone into receivership. Another casualty is Modular Robotic Systems and the last pits were read over another British robot, the Pam 2, when ASEA of Sweden recently acquired VS Technology and its Remek offshoot.

Customers just do not seem to be interested—and small wonder, according to a survey by Thorn EMI. It found industry believed robots will not fit existing processes, are uneconomic and the technology is inadequate. Investment in traditional heavy industry has been either curtailed or postponed and the spot welding market on which many of the robot builders have come to rely, particularly in the car industry, has reached saturation. It is also under pressure from gluing and bonding. British Robot Association figures for 1985 are unlikely to give spot welding the 35 per cent growth it showed in 1984.

But the figures are likely to show an upsurge in light assembly, particularly for such things as small electric motors and electronics. The small electric motor used to be a collection of small pieces which took a long time to put together. Now most of a motor can be moulded so that the pieces go into the casing from the top. This makes it so easy to assemble that even a robot can do it.

This and the electronics market call for highly accurate and fairly expensive machines of a type few British makers excel in. Leaders are Toshiba (imported by Evershed) and Sanyo Selki (sold by IBM). National Panasonic's machines are likely to have a big impact on the UK market now that Panasonic has signed an agreement with Altek of Cambridge.



According to Frost & Sullivan, the use of robots in electronics will increase from 17 per cent of a \$722m robot market in 1983 to 22 per cent of a \$85m-plus industry in Western Europe in 1990. Competition has caused large amounts of investment and development time to be put into changing products to make them better suited to assembly robots.

The redesigns may mean changing board layouts to make automated assembly easier. In many cases, even for small companies, they have meant some serious talking to suppliers whose integrated circuits, choices of edge connectors have not held to a consistent shape. One way electronics suppliers have cut their headaches is to pack components into aspirin-type bubble packs. The packs, which may contain integrated circuits, coils or similar devices, have location pads which allow a blind robot to pick them up and insert them precisely.

The big electronics automation story, however, has been surface-mounted devices (SMDs). They are smaller, designed for automated assembly, and offer cheaper pro-

duction than conventional electronic assembly. Mr Alex Clark, of Mullard says half the world's electronic circuits will use SMDs by 1990 — although fewer than that in the UK because its consumer electronics industry has disappeared.

SMDs need a different production approach than components with leads. High-volume SMD machines dislodge components easily. Conventional boards can be checked after production and faulty or dislodged components replaced, but once an SMD board has been soldered it cannot be rectified. Electronics companies are installing vision systems to check each board and instruct a robot to correct any badly placed components before they are fixed on the board.

High packing densities for conventional components mean the leads have to be accurately cropped. Robots can now clip all the leads to the same length, regardless of warps in a board. A less-cropped 'cell' costs about \$30,000, half that of a couple of years ago. But it seems unlikely that suppliers will make any money until their price comes down at least another third. It will happen

within the next year or so, but only after more casualties.

As the price falls, three other things must happen:   
 • Better robot simulation, with easier built-in off-line programming. This enables the user to feed a new programme to a robot without taking it out of commission to teach it new tricks. It saves money and, being safer, may save lives.

One system which has caught attention is made by Robot, of Israel, but Intergraph's system has to be a front-runner, if only because it was developed with the world's largest robot company, GMF, the joint venture between General Motors and Fanuc. GMF dominates the US robot market, though it has yet to make serious attempts to break into Europe.

The second is the development of fixed price kits of parts for add-on conveyors and feeders that customers can shop for in catalogues. The robot market will continue to suffer until its products are available as a series of building bricks.

Related to this is the abandoning of systems work. The ideal is to sell the equipment in boxes and set someone else another with state backing and an over-priced product better used in development than on the shop floor, British Robotic Systems. More hopefully, venture capital company SI has just put more than \$750,000 into Visual Machines of Manchester.

In the US, machine vision is dominated by companies like Automatix, View Engineering, Machine Vision International and Perceptics. The most visible US company in the UK is Iran. Its programming approach is praised even by competitors. Iran, no longer crippled by high dollar-exchange rates, and producing cheaper products, is causing UK vision companies concern.

The European vision systems market, now worth about \$190m—of which Frost & Sullivan says 60 per cent is in inspection systems—will be worth about \$250m in 1989. There is a hopeful straw in the gate. If the UK follows the example of the US then after a continuing shakeout in 1986, the analysis says, times are ahead. They will need to be good times indeed.

John Dwyer is consulting editor of *Automated Factory*, a Financial Times FinTech newsletter.

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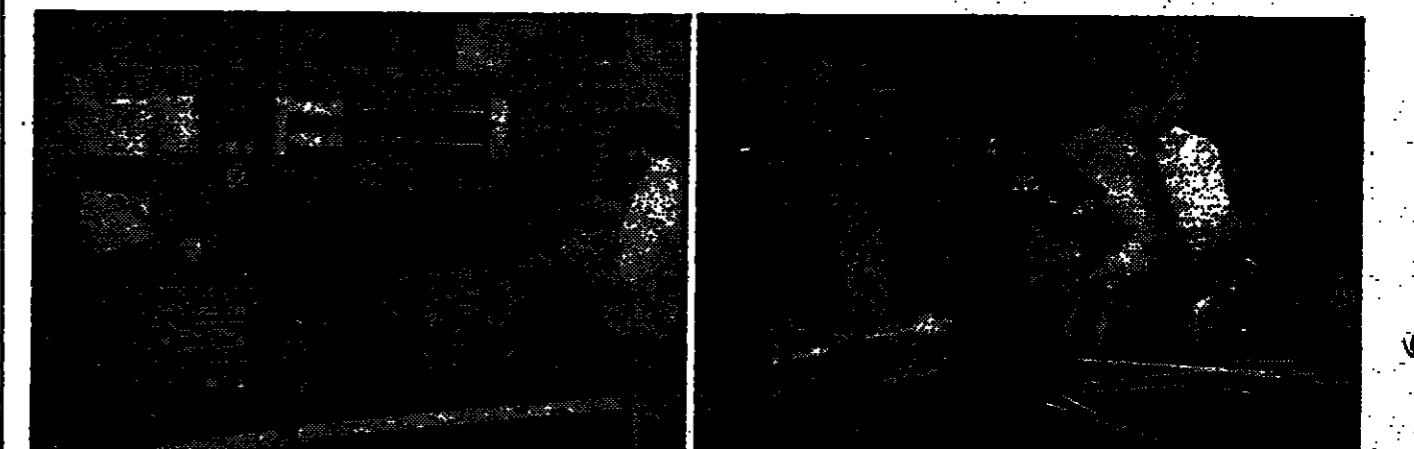
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A 600 Fanuc Model 3 robot stacking palletised packages (left). Another form of robot (right) developed by Ferranti in Dundee being programmed for flexible laser welding of a car door

## PROFILE: FANUC

BY CARLA RAPOPORT

# Young company far ahead of the pack

IN THE world of computerised numerical control systems few companies can touch Fanuc, the young Japanese company nestled near the base of Mount Fuji.

Since its listing on the Tokyo Stock Exchange in 1976, Fanuc's net income has grown at an average annual rate of 57 per cent, with sales up an average of 37 per cent per year.

According to Merrill Lynch, Fanuc is also one of Japan's most profitable companies, with an operating profit margin of about 35 per cent.

"We believe Fanuc supplies 45 to 50 per cent of all CNC systems manufactured in the world and about 65 to 70 per cent of all those manufactured in Japan," says Mr Ben Meyer of Merrill Lynch Japan.

Lack of strong competition, he points out, plus good product quality and high level of service has allowed the company to maintain price leadership in the field and avoid costly price-cutting wars.

Further, Fanuc has long been committed to continual plant improvements and product up-dates.

For the current year, ended this March, Fanuc recently announced it expects sales up by 23 per cent to ¥175bn. CNC systems for machine tools, the company said, are expected to increase a healthy 19 per cent to ¥138bn, while unit sales of industrial robots will have doubled to around 3,000 sets worth ¥21bn.

**Japanese machine tool orders**

Financial Year to March	CNC Machine Tools		Total Machine Tools		Domestic Auto Industry		Exports	
	Y bn	% Change	Y bn	% Change	Y bn	% Change	Y bn	% Change
1976	40.3	8.3	156.7	-18.3	21.4	6.8	85.6	28.9
1977	78.1	78.9	242.5	60.8	61.2	196.6	60.7	70.2
1978	82.1	71.1	271.0	11.5	62.9	2.5	79.5	31.6
1979	123.3	50.1	338.9	20.3	61.9	-1.6	88.5	10.9
1980	220.3	78.7	489.1	50.1	114.4	84.5	120.6	47.4
1981	323.1	48.7	631.7	29.3	169.0	47.5	167.0	27.9
1982	338.2	4.9	618.9	-2.0	129.3	-17.6	151.3	-9.3
1983	326.5	-3.9	493.4	-20.3	100.6	-27.7	107.3	-29.0
1984	375.0	30.9	588.6	17.7	98.3	-2.5	144.4	34.3
1985*	496.0	32.8	760.0	30.9	151.0	33.2	204.0	38.5
1986*	566.0	12.4	845.0	11.2	150.0	14.5	235.0	17.5

\* Estimates  
 Orders are for 68 companies  
 Source: Japan Machine Tool Builders Association, Merrill Lynch estimates.

In industrial robots, one of Fanuc's major customers is a joint venture set up with General Motors, called GMF. Fanuc supplies about 65 per cent of its robots to the joint venture. Merrill Lynch estimates that in 1984, GMF became the largest US supplier of robots with sales slightly over \$100m and a share of total US robot shipments of about 30 per cent.

In order to hold on to this lead, Fanuc is investing heavily in new plant. This year, out of a total of ¥268m capital outlay, Fanuc is putting ¥25bn into a second robot assembly plant as well as nine technical centres throughout Japan.

Further, one of the keys to Fanuc's success in the industrial robot area, is its insistence on the in-house de-

velopment of robotic control devices and servo-motors. These components, which make up as much as 50 per cent of the value of a robot, have been constantly improved upon since Fanuc built its first robot in 1974.

In the CNC systems area, Fanuc is moving toward programmable systems which allow the most flexibility for its customers. In earlier model, master programs for the machine tool or robot were designed by Fanuc and were fairly rigid in application. As a result, competitors who bought Fanuc components could offer similar systems, however, allow the machine tool builders to design their own programmes with Fanuc's assistance, if needed.

Looking ahead, analysts predict Fanuc will gain strength in CNC software applications and in overseas production. Meyer of Merrill Lynch predicts that software application could become a proprietary business for Fanuc in future.

"For smaller machine tool builders without the capacity of in-house software development, the availability of ready-made software could become an incentive for purchase of Fanuc hardware," he says.

Meyer also predicts that within the next few years, Fanuc could double its overseas assembly to 300-400 units per month. Currently, Fanuc is making about 150 units in the US, 100 a month in Europe and about 25 a month in Korea.

# Limited success in low volumes

## Small Batch Production

ANNA KOCHAN

MANUFACTURING industry is having to automate small batch production to supply a more demanding market. Automation involves considerable investment and risk which has, in the past, restricted use to large automotive, aerospace and defence companies, but machine tool companies have come up with a solution for even the least experienced manufacturer.

Low-volume automation can be viable only with equipment that can handle a wide variety of products. The same equipment should be able to change from producing one product to another with minimum delay and stay occupied through two or three shifts. It has to be computerised and involves considerable expense on software development, mainly because each application is highly customised. Equipment of this kind, often referred to as a flexible manufacturing system (FMS), has gained popularity in recent years but it is expensive, difficult to justify and has found limited success. The most advanced FMS being installed in the UK, for

example, is a multi-million-pound investment at British Aerospace in Preston. It will include eight machining centres, two co-ordinate measuring machines, a central cutting tool store, automated storage and retrieval system for palletised parts, intermediate buffer store and automated vehicles. The system will use the Automax two-spindle horizontal machining centre launched by Marwin Production Machines in 1984. This was designed along the lines of the Molins System 24 built in 1967, thought to be the forerunner of today's FMS.

The Automax machines handle billets of metal mounted on pallets fed horizontally into the machine and then rotated for horizontal machining. A double-sided pallet loading mechanism gives a 30-second pallet change-over.

Each machine has three 62-tool crates arranged to allow the crates to shuttle into position. Transfer arms change the tool in the spindles in 10 seconds.

The handling of cutting tools is one aspect of FMS which has gone through dramatic development. In 1981, scepticism greeted Yamazaki's use of an overhead gantry to transfer tool drums between tool-setting stations and machines to enable automatic supply. The cost was thought unjustified and the problem of tracking the tools

insoluble. Today, almost every new FMS incorporates automatic tool transfer. In the £2.5m FMS that JCB Transmissions is building at its Wrexham plant, the 10 Scherzmann machining centres are being supplied with two tool magazines. One is permanently attached to the machine and the other is shuttled back to a tool preparation area on an AGV when worn tools need to be replaced or new ones collected.

With such large numbers of cutting tools moving round the machining systems—the JCB system may have more than 1,000 in service at one time—it is important to keep track of whereabouts and performance.

Many FMSs use bar code labels on shanks, with tool-setting machines linked into the FMS computer system. But errors can occur. The labels are apt to come off while different tools can often look similar, causing mistakes when humans get involved.

Several West German cutting tool manufacturers have developed a programmable micro-processor-based tag embedded in the tool shank. One of the first applications is in the £1.5m FMS at Ingersoll Rand in Wigan, being supplied by TI Machine Tools.

Each of four machines has a magazine of 120 tools and each tool has a Bilz chip-based tool-data carrier in its shank.

The carrier is programmed with a tool identification number and tool offset values at the presetting machine. This information is read as the tool goes into service at the machine tool.

In theory it is possible to record details of tool life data on the carrier but this is not being done at Ingersoll Rand because of the complexity. The FMS installations mentioned so far were all highly customised, each involving a large number of suppliers. The risk is not merely financial but also technological. For any but the most knowledgeable user, an FMS installation has been a terrifying challenge.

But this is changing. At the GEMO exhibition in Hannover last autumn, several machine-tool builders showed standard off-the-shelf solutions to flexible machining which should appeal to even the most inexperienced of users.

The off-the-shelf solutions are also modular. They include a variable number of machine tools, variable capacity of tool storage and pallet storage, cell controller and suite of software programs. All the user has to do is select the modules. West German companies Decker, Zoller, Hüller Hille, and Fritz Werner demonstrated variations as did Makino and Yamazaki of Japan.

For Fritz Werner the standard solution is not new.

Having demonstrated its design at Paris in June 1983, the company claims to have sold almost 50 systems varying from two machining centres to 12.

The first delivered in the UK should be completed this year for Mirreles Blackston of Stockport, the diesel engine manufacturer. The £1.9m system incorporates a line of four machining centres between a line of pallet setup stations and a line of tool racking. A rail-guided cart at the rear changes tools.

Another rail-guided cart at the front shuttles pallets between the stands and machine tables. Mirreles intends to operate the system unmanned for as long as four hours between shifts or for even longer at weekends.

Makino has also found a customer for its off-the-shelf FMS in Cummins Engines at Shotts, Scotland, where a three-machine system is being built. It uses a rail-guided

stacker crane to transfer pallets between the machine tools and the pallet racking but will not employ auto tool transfer.

These new developments from the machine tool manufacturers should enable a larger proportion of industry to take advantage of flexible manufacturing techniques.

Anna Kochan is editor of The FMS magazine.



Valve-guide assembly and insertion at Jaguar's Radford, Coventry, plant produced by Dainichi Sykes Robotics

### PROFILE: JAGUAR/DAINICHI SYKES

## Islands of accuracy in tailored system

VOLUME car-manufacturers were among the earliest companies to introduce robotics and other automation systems, making substantial cost savings and improving quality. But a different approach is being taken by Jaguar Cars to achieve the same ends.

The Coventry-based company, while riding the crest of a strong recovery in demand for its cars, has accepted that it must benefit from the cost-effectiveness and quality advantages of automation, but at the same time retain the attention to detail which makes Jaguar unique.

It is also gearing up for the launch of its long-awaited new model, the XJ40, later this year. This has provided an ideal opportunity to introduce a programme of automation being carried out in conjunction with Dainichi Sykes Robotics of Preston.

Jaguar and DSR have entered a long-term technical collaboration agreement covering introduction of advanced manufacturing technology into Jaguar factories. Much of this has been carried out at Radford, Coventry, where the new engine for the XJ40 is already being produced.

### Consistency

Unlike volume car production, where robots were introduced on the production line for tasks such as welding, Jaguar is introducing robots in "islands of automation" which can be fully integrated later.

Mr Eynon Thomas, plant director at Radford, said that nearly £2m had been invested in factory automation, and an additional £1m was being spent. Spending of between £5m and £10m on further automation was being considered.

"Accuracy and consistency of production lead to a more reliable product and that is what we are achieving," he said. Return on investment is about 15 per cent, but as production increases, this will increase to about 30 per cent. Additional benefits such as increased sales derived from higher quality are more difficult to quantify.

DSR was chosen by Jaguar after an extensive evaluation of factory automation specialists. All the systems are tailor-made for Jaguar, since there have been few similar installations.

DSR has committed full-time personnel to form a team with Jaguar production engineers, guided by a steering management. The first automation cells form an advanced automation area covering the production of 24-valve aluminium AJ6 engine cylinder heads.

These have been established according to the Manufacturing Automation Protocol (MAP), the General Motors system for sending data around a factory in a common way. Each system's program logical control is capable of being linked to the company's central mainframe computer. Full integration of design and other functions should be introduced eventually.

One island of automation at Radford covers the assembly of water pumps, with a Dainichi robot picking and placing components from a rack. At Castle Bromwich another centre is carrying out bonnet assembly work, while the sealing of joints is another bodywork function being considered for automation.

Mr Thomas said that sub-assembly operations were the most likely candidates for automation. Jaguar's component suppliers were being kept informed about new develop-

ments, as was the workforce. Full discussion with employees had produced greater flexibility on jobs.

Some tasks normally undertaken by robots on motor manufacture were not suitable for Jaguar, he said, since the quality achieved by hand could not be improved.

However, it was the flexibility of the new generation of robotics which had proved so valuable for Jaguar. "The equipment is improving all the time, but you have to take a risk and go ahead at some point, but it is expensive, difficult to justify and has found limited success."

It was essential that maximum flexibility of systems should be achieved, with the ability to retro-fit capabilities that may be necessary in future. Training had also been a vital requirement and this was being carried out jointly by DSR and Jaguar with co-operation from the workforce. In the longer term, it was unlikely that there would be any significant increase in the numbers employed by Jaguar, in spite of the expected rise in output.

Another big advantage of automated systems was their ability to be monitored consistently for quality. This was carried out by quality control automation systems, which sense and automatically correct changes. Machine operators have become responsible for quality.

Cells at Radford involve valve-seat insertion, port blending and valve-guide assembly and insertion. The valve seat and guide systems have replaced laborious and repetitive manual operations, while the port polishing system has speeded up production and eliminated a tedious manual task which could never be carried out with consistency.

Aluminium cylinder heads which have been part-machined are fed to a furnace which heats them prior to delivery to the valve-seat insertion system, where a robot places valve seats in the casting. Prior to automation, this was carried out manually, with the operator working in a hot and unpleasant environment.

### Sensors

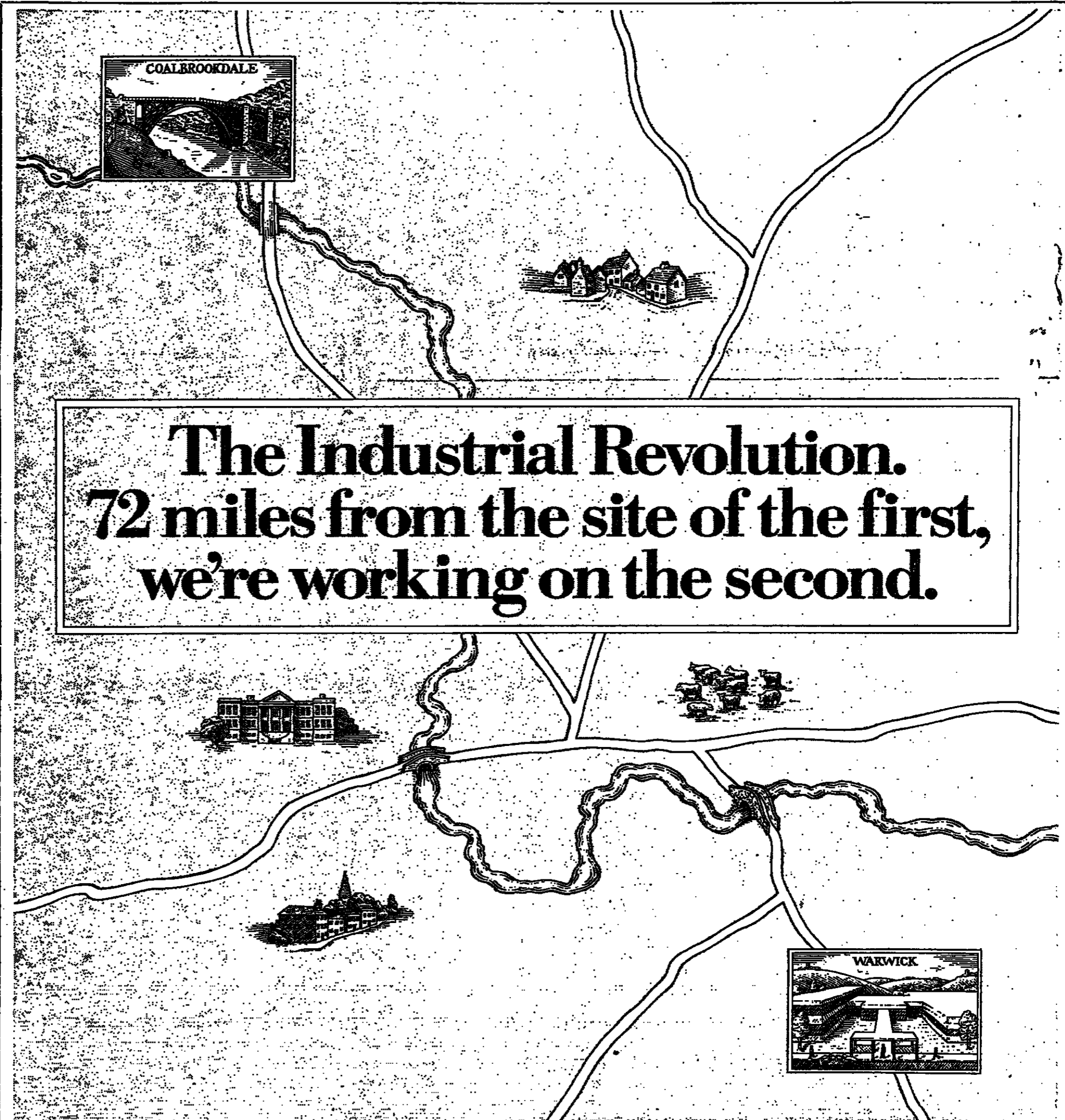
The cylinder head is passed through a cooling tower to the part-blending system. When done manually, this operation was difficult and physically demanding, taking up to 48 minutes for a 24-port head. Inconsistencies in the work resulted in variations in gas flows when the engine was running, causing variations in performances.

The automated system produces an ideal blended cylinder for each port, reducing the work time per head to just 12 minutes — a 400 per cent improvement in productivity — allowing the processing of up to 50,000 cylinder heads per year.

On completion, the robot cuts an identification mark on the head to allow the quality control department to establish which robot worked on the head.

At the next cell valve guides and circlips are assembled automatically at the rate of one every six seconds and inserted by robot into the cylinder head. Sensors measure the size of the bore to ensure that the guides will fit accurately and confirm that the guides have been picked up accurately by the robot.

Lorne Barling



# The Industrial Revolution. 72 miles from the site of the first, we're working on the second.

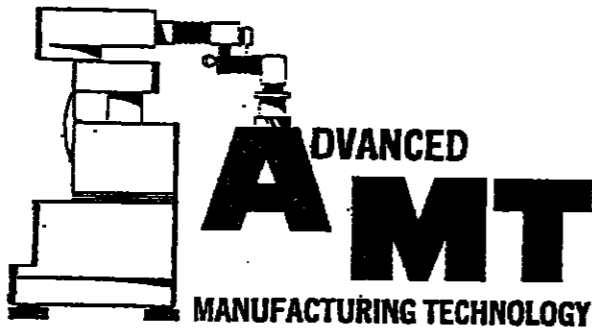
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## Manufacturing Automation 4



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A Stadco robot arm (above) handles 600 kegs an hour at Bulmer's of Hereford. A Jungheinrich AGV (right) being tested for carrying engines at the Cummins plant in Darlington



Mike Aired

## AGVs set free to wander

### Materials Handling

JOHN DWYER

GENERAL MOTORS recently placed what may be a world record order for automatic guided vehicles (AGVs), the driverless trucks which trundle self-importantly round factories and warehouses. GM has ordered 600 Volvo AGVs for its Oshawa, Ontario, factory adding to the 425 from Conco Telex, to create its biggest AGV fleet.

The Volvo order is greater than the entire UK population of AGVs, where there are installations at Massey Ferguson, Austin Rover and JCB Transmissions and the 14 BT Roll-trac AGVs at Perkins Engines.

Sales of electric trucks, including AGVs in the UK were £1.7m in 1984 out of a fork lift and industrial truck market of more than £200m, according to Business Monitor. One reason is the scarcity in the UK of

large flexible manufacturing systems (FMS). AGVs are best used where automated machines are combined with a large storage area. They use less space, are less cluttered and more easily routed than a conveyor. They are also versatile — GEC has some that use a goods lift.

AGVs make loading and unloading simpler. A cheap push-off, push-on device can be used instead of a robot. Parts can be moved with jigs and fixtures in place.

But the AGVs may be only a small part of the total cost. The truck will cost from £10,000 upwards — Deep Sea Seals of Portsmouth runs a single Babcock FATA Microtruck in its FMS which cost £70,000. But 30 to 40 per cent of the total cost is floor preparation and at least the same again is needed for the control system, especially the interfaces with the production control computer.

Even if the floor is level, the AGV's route is confined to the painted line or buried wire it has to follow. Buried wire allows the AGV to choose routes, production schedule, but new routes need new buried wire.

Factory managers would prefer to see a plan of the factory floor on a CAD screen, draw the AGV route on the screen and transfer it to a free-ranging AGV guided by radio or infrared signals.

### Triangulation

At least three British universities and the National Engineering Laboratory are working on free-ranging AGVs. Cranfield Institute of Technology is working on a free-ranging, three-wheeled AGV called Craft which has coarse and fine navigation systems. The front wheel drives the AGV and rotary encoders and pulse counters on the back wheels tell the AGV where it is.

The AGV's back corners have

infra-red sensors to guide the truck along white lines where it has to dock. Cranfield says the AGV costs £5,000.

Imperial College is also taking the free-ranging AGV route, again using optical encoders and counters on two wheels to measure position. Imperial is studying ways to recalibrate the AGV every so often by triangulation. The AGV is instructed by two-way FM radio or, where welding and other equipment might interfere, by infra-red.

The National Engineering Laboratory is about a year away from showing its prototype AGV. This will combine radio for control and down-loading of scheduling information with infra-red sensing but is still at an early stage of development. Warwick University is also working on a free-ranging AGV. The early part of this work, which involved the use of new sensors, navigation systems, control and communications techniques and software, was funded with £200,000 from Lansing Bagnall.

These may solve non-existent problems. Earlier, perhaps, is Lansing's attempt to develop AGVs which use a wired route as a main path but can leave it to go to machines or loading stations — or round faulty AGVs — under the control of an on-board computer. The computer uses data fed to the truck while it was on the wired route.

Lansing's Mr Peter Kitchen says the trucks they are working on are capable of docking accuracies of a few millimetres after off-wire journeys of tens of metres. After a task, the AGV returns to the wire and its position is recalibrated.

Free-ranging AGVs sound a good idea: AGVs show most benefit where there are many collection and delivery points. But the more flexible they are, the more complicated the routes they may follow. Any AGV plan could be run through a simulation package: Istel does one called SEE WHY, but the

Inbucan consultancy has studied others.

The number of AGVs needed in a system needs careful thought. If machining cycles are long enough a few can serve a large number of stations. But Mr Ken Firth, of the National Materials Handling Centre at Cranfield, cites one supplier which said a system needed 12 AGVs but another quoted four. That is where the simulation comes in.

AGVs will affect the traditional fork-lift truck makers less than world overcapacity has hit them. The AGV will replace the hand-pallet truck and complement the traditional fork-lift, which comes into its own at the edges of an operation.

### Random

For example, even a large FMS does little of the work in a factory and is unlikely to make the finished product. The FMS, with its fleet of AGVs, may machine half a dozen main castings for a machine tool or textile machine. But the motors, gear boxes and other parts for the finished item have to be moved from elsewhere.

Neither system is 'new', and most of the interesting developments concern AGVs, but conventional transport systems are often made more effective by combining them with AGVs. At Vauxhall's Ellesmere Port plant on Merseyside, for example, doors are removed after the car bodies have been painted and put on Schindler Digatron AGVs which take them to workstations to be fitted with panels, windows and winding handles.

Dashboards and pedals are also assembled away from the main car body line. The quality of the dashboards improves because they are more easily assembled and throughput improves because the dashboards are easier to fit with the car doors off. Other car manufacturers are taking up the idea.

AGVs are less flexible than driven fork lifts and can give problems. The main one, again,

is an uneven floor. An AFL has to pick up its load accurately, which may mean using special pallets, and hold it in the same position throughout its journey. If an uneven floor makes the load shift or change shape the truck will either be unable to deliver the load at the other end or a photo-electric detector on the truck will stop it until the load is put right. Wear on wheels and brakes make it even harder for the truck to find its load.

But AGVs and AFLs are not the only way of moving goods around an automated factory. The car industry uses a lot of chain conveyors because they are rugged, easily buffered and reliable. When properly maintained, the chain conveyor can have elevated and drop sections which allow parts to be moved easily up and down between floors or well about head level except when needed.

A variant popular in the US is the self-propelled monorail carrier. Like the chain conveyor, it can travel at any height, but it can be reprogrammed in mid-journey, and is very quiet.

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PROFILE: JUNGHEINRICH

BY NICK GARNETT

## Late starter shoulders into market

THE West German industrial truck maker Jungheinrich, is trying to move quickly into the manufacture and supply of equipment and systems for automated factories after a slow start. One glance at the company's new production site at Nordereck near Hamburg tells why.

To help keep its competitive edge as one of Europe's three biggest manufacturers of electric industrial trucks like forklifts and stackers, new automated production systems are being installed at Nordereck. That will be good for efficiency but one victim might be its own industrial trucks.

Nordereck has 150 of these, excluding hand operated pallet vehicles to ferry materials. But as automatic guided vehicles (AGVs) and other systems are brought on stream at the plant, the requirements for operator-driven trucks will not be so pressing. This is even more true in the general drive towards automated ware-

housing. With industrial trucks forming 75 per cent of Jungheinrich group turnover, the growing use of AGVs and more standard driverless industrial trucks in industry could not be ignored. As many other manufacturer companies are following the trend towards automated transport systems, Jungheinrich saw not only an opportunity but a real need to get a slice of the automated manufacturing equipment business.

It has already supplied 470 floor-guided and driven AGVs for carrying materials, components and engines at the

Russelsheim plant of Opel, General Motors' West German subsidiary. Another 26 are being installed at the Cummins diesel engine plant at Darlington, in the north-east of England. These will carry work benches carrying engines and the men working on them.

Jungheinrich has also tendered for four big contracts at Ford's European manufacturing locations. This is aside from its more long-standing business of supplying automated warehouse systems. The latest, for Kodak at Hemel Hempstead in England has given the US film and camera company one of the most advanced warehouses in Europe.

### Diversification

Jungheinrich is the first to admit that it should have shouldered its way into this business sooner. The family-owned company, which employs 4,000 people, developed its first automatically controlled truck as far back as 1922, only to abandon it to meet production demands for operator-driven industrial trucks.

"We had a big opportunity," says Mr Gunter Dyer, Jungheinrich's production planning director. "We would now have had a much bigger slot in the market."

Underlining its diversification into automated systems, Jungheinrich created a separate division in 1984 — Jungheinrich Anlagen Technik (JAT). Its guiding hand is Mr Eckart Kottkamp, main board member for technical development, who says the automated systems division accounted last year for

DM 40m (£10.6m) out of the group's total turnover of more than DM 900m.

The JAT figure, however, does not include the value of most of the metal fabrication work taken into the figures for Jungheinrich's main manufacturing operations.

Automation is a new market for the company and potential field of diversification, Mr Kottkamp says. The division's main aim is to sell production "solutions" to other manufacturers not necessarily using Jungheinrich products.

Jungheinrich works with a cluster of companies, selling their products as part of systems. It does not make stacker cranes, for example using instead those made by Inambach or Seisag. It does not make conveyors but takes them from Thyssen. It has also abandoned the manufacture of racking systems, taking them from outside.

The company also claims to be Europe's biggest supplier of welding robots in collaboration with Cloos, the welding equipment specialist. Jungheinrich carries the arm and carries out much of the engineering. It started developing robots eight years ago and production began in 1980.

The company's AGVs are made at Wandsbeck on the outskirts of Hamburg, the main manufacturing site before the bulk of industrial truck production in West Germany was transferred to the DM 85m Nordereck plant.

Some of its automated systems use what look like ordinary industrial trucks but are guided on tracks,

Jungheinrich is also examining the possibility of producing a hybrid AGV-powered pallet truck for order picking.

Jungheinrich's driverless transport system is called Ametec Teletrak. Vehicles are guided by an electric wire installed in the floor, the trucks receiving instructions through microprocessors linked to a central computer. Workbench AGVs like these at Jungheinrich's technical division at Nordereck.

### Tailor-made

The company's complete automated systems also include a gantry-type robot for automatic palletizing — lifting up four pallets, then transporting to a marshalling area — and driverless narrow-aisle trucks. Control systems and some software is produced at Jungheinrich's technical division at Nordereck.

Jungheinrich has sold its KTX tailor-made automated warehouse systems for more than a decade, using wire or radio signals. Kodak's automated warehouse, put together by Manchester-based Jungheinrich GB can store 7,000 pallets. Almost all movements are fully automated from the receiving station and into one of bulk stores. Three Jungheinrich driverless narrow-aisle stackers work with five AGVs. Computers and software were contracted out.

It is in manufacturing, though, where the greatest technological leaps are possible. "In assembly work it is not a machining problem but a flow problem," Mr Kottkamp says.

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EATON



BY ANNA KOCHAN

# Machines get the measure of quality

**Inspection**  
JOHN DWYER

**AUTOMATING JUST** to reduce costs does not work. Automation should boost market share or it is a waste of time, and better quality is the way to do it. Quality control has to make sure no defects get through.

How to get there depends on what a factory makes. Harvey Spicer, for example, is using cameras to seek cracks in constant velocity joints. Cameras can also take measurements, but where accurate manufacture is essential, the co-ordinate measuring machine (CMM) is the best answer, especially for measuring details hidden round corners.

CMMs are computer-controlled machines which can be programmed to go through a routine set of measurements of solid objects. A probe at the end of an arm switches when it touches an object's surfaces. CMMs take various forms, depending on the size of the object measured. The most familiar in engineering is the gantry type. The measured object is placed on a solid (usually marble) table and a measuring arm mounted on an overhead gantry carries the probe, usually a Renishaw, around the object.

### Tireless

The world market for all types of CMM last year was worth \$224m, according to market analyst Datquest.

CMM-maker LK of Derby had multi-million dollar orders from General Motors, which two years ago decided to replace its manual fixed gauges in 27 body plants with \$15m worth of measuring machines and programmable gauges. Ford then began its programme with a \$5m order for four machines and an option on four more.

Ford says the machines reduce measuring cycle times by

half. Cylinder blocks, for example, are taken off the line and one of 15 measuring programs controls the probe-tip over a five- to 10-minute series of measurements. Ford intended to rely on print-outs listing any machining-errors in the blocks, but now uses information from the CMM to signal changes at the machine tools which carve out the blocks.

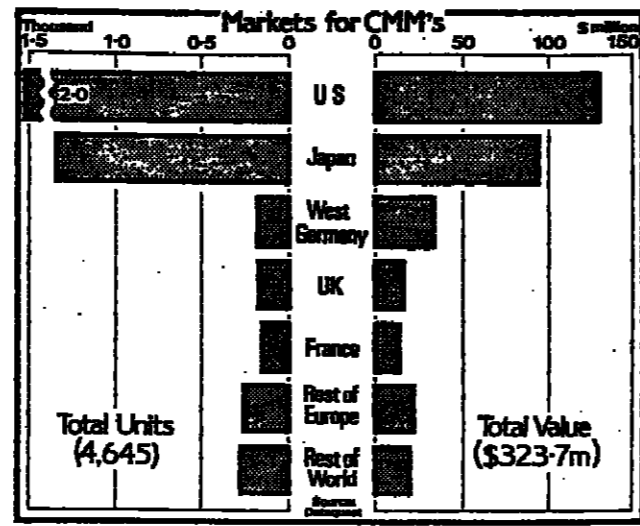
It is an increasingly important market, not just because CMMs provide the non-human advantages of tirelessly accurate measurements which can be accessed directly by a database. A lot of companies are developing ways to use CMMs in flexible manufacturing system (FMS) cells and to link them with computer-aided design (CAD) systems to generate the CMM's programs automatically. The CAD system which makes a part could also generate the CMM routine to check it.

CMM-maker Spindix is working with Computervision to link CAD and CMM systems, and other projects funded by the US National Bureau of Standards. DEA of Italy is working with Computervision and IBM's Lockheed-developed CADAM system.

LK, its parent Cincinnati, Ferranti and KIM are working in the UK on programmes to put CMM systems into flexible manufacturing cells, and Brown & Sharpe also has a system.

Toyota says CAD-linked CMMs have solved a serious bottleneck in its production of new models. Information from surface models in the CAD system's computer is fed to a CMM where car body stamping dies are finished by hand. The CMM runs over the stamping die and compares it with the computerised model.

Four suppliers are world leaders in high-accuracy. Leitix of West Germany; Moore Special Tool of the US; Zeiss of Switzerland. Accuracy can be less than 1.5 microns in a one cubic metre working space. These are laboratory machines



which are expensive, slow to operate and come in a restricted range of sizes.

Such accuracy is not needed in manufacturing and industry normally goes to the next layer down. This includes such names as Cincinnati/LK, Ferranti, WA Metrology, all of the UK; Brown & Sharpe of the US; Renault of France (distributed in the UK by Federal Gauges); DEA of Italy (Fairley Automation) and Johansson of Sweden. The Japanese are not well known in the market, the only big company being Mitutoyo.

LK, which Cincinnati Machine bought a year ago, is one of the leaders. In 1984 its orders went up to \$30m from \$28m and it continues to double its size each year. Exports were 70 to 80 per cent, nearly all for the US.

### Problems

One of the most exciting developments in CMMs relates to their software. On a straight-forward three-axis CMM there are 21 sources of error, seven on each axis.

Errors on the probe can also arise if it is not perfectly normal to the surface it is measuring.

All these errors can be corrected using software. Zeiss and some Leitix machines have this capability but the software should percolate right down the range in time, allowing greater accuracy for more cheaply-built machines. The best industrial CMMs cost more than \$20,000 each.

CMMs have other problems. For instance, the CAD systems they are linked to do not usually store tolerance information. Also just as different machine tools have different controllers, each CMM program has to be post-processed for each make of machine. The research organisation

CAM-I is working on a dimensional-measuring interface specification based on McDonnell Douglas's two-year-old CMM interface. It will be put forward as an international standard for interfacing with CMMs, but there is now a growing catalogue of CAD/CMM software.

The accuracies CMM makers quote are not expressed so that users can compare machines from different makers. Some makers' accuracies only apply in specific, usually impractical, circumstances such as when the arm of the CMM is at rest at the top of its gantry. The quoted accuracy is useless as a guide to how the machine will perform when the arm is extended three or four feet below this to the measuring table.

Some machines' definitions of form like roundness and flatness are incompatible with the algorithms used in data-processing. Several variants are used, which can cause wrong or inconsistent results. The validity of the software needs to be checked independently.

There are ways of checking the accuracy of a CMM. Verification laboratories, such as FEB in Germany, the National Physical Laboratory (NPL) in the UK, and the NBS in the US have CMMs which have been accurately calibrated to measure test-objects accurately. The user can then take the test-object and see what readings he gets on the CMMs he looks at.

The British Standards Institution has published the first two parts of a draft standard on the use of CMMs. When complete it will give users the measurements they should take, the directions of travel to use and the readings at the probe tip they should get if they follow the guidance.

### PROFILE: ISTEI

## Image change sends revenue soaring

ISTEI COULD have been described as ahead of its time when formed as BL Systems almost six years ago. Few manufacturing enterprises were ready to take on local area networks or computer-integrated manufacturing, the main part of its expertise. Today, they are crying out for it. Istei may have more experience in the field of systems integration than any other in the UK, and is a company going from strength to strength at home and abroad.

BL Systems (BLSL) was formed as a subsidiary by amalgamating the systems departments within British Leyland. Considerable expertise in computing, communications and systems had been built through supplying the needs of BL, and management felt this was in demand outside the group. Management was right but the broader market took some years to realise it.

Having started with 1,000 employees and a turnover of \$17m, BLSL had managed to increase turnover to \$22.5m by the end of 1983 but had no significant external sales. A change of image was thought to be the answer. Mr John Leighfield, managing director, felt the image of a computer department within a car com-

pany had been the main factor hindering sales.

In 1984 the name was changed to Istei, and by 1985 it anticipated a revenue approaching £50m, of which £15m was expected to come from external sales. The company now employs about 1,200 people and expects external sales to grow by 50 per cent a year and internal sales at 10 per cent over five years.

One of BLSL's first big projects was at the Longbridge Ford Metro factory. Systems integration in this plant involved linking more than 200 programmable logic controllers using about 72m of special broadband coaxial cabling. Similar work was done at Cowley on the Triumph Acclaim and Maestro production lines. Fairley Engineering was one of BLSL's first external customers, with a contract worth £208,000 to cover systems requirements for five years. This was expected to include production planning, computer-aided design, flexible manufacturing systems (FMS) and production monitoring.

More recently Istei has begun to establish a reputation as a systems supplier for FMS. It has twice delivered FMS installations for TI Machine Tools.

A project for Deep Sea Seals incorporated a TI machining centre and a Webster & Bennett turning and boring machine, both fitted with Fanuc controllers, as well as Babcock FATA automated-guided-vehicle and DEC supervisory computer. Istei was responsible for interfacing equipment and writing software for programming, scheduling, generation of work plans and tool monitoring.

### Integrator

The BL systems house has turned its expertise into marketable products like SEE WHY, launched in 1979. This was the first user-friendly software package for simulating dynamic and interactive industrial facilities, and many have tried to emulate it.

In 1981 BLSL launched its factory management information systems program (Famis), designed to run on Digital Equipment computers to control and monitor all factory operations. Today the factory automation activity of Istei is centred on Istei Automation, a computer integrated manufacturing operation set up last November. Not only will it act as a system integrator for advanced manufacturing projects but will also take the role of prime contractor for projects involving management consultancy, simulation, production and process engineering, plant and equipment supply as well as systems engineering.

Mr Mike Grant, managing director of Istei Automation, is establishing informal collaborative agreements with hardware suppliers, as such projects require close relationships. These include TI Machine Tools (machining centres and lathes), Babcock FATA (AGVs), Arthur Young (management consultancy), IBM (computers), and Allen Bradley (controllers). Istei Automation's first contract is with Jaguar.

Istei is determined to keep ahead of the times. It has probably acquired more knowledge than any other UK company about the manufacturing automation protocol (MAP), which is crucial to manufacturing automation in the future. It is also working on artificial intelligence techniques, likely to be equally important, and plans to open 30 offices around the world over five years. Talk about privatisation is in the air, and when a purchaser appears who is able to convince management that the needs of internal BL companies are secure, the company will become independent.



### Trailer-made by a smart sensor

Crane Fruehauf has introduced robotics into production at North Walsham, Norfolk, the biggest trailer manufacturing centre in the UK. The IRB 6, from ESAB Automation, has a Smartare sensing system for suspension assembly and welding—highly stressed components needing quality welds. Future applications could include welding trailer cuppers and bulkheads and, ultimately, complete assembly and welding of standard platform trailer frames, the company says. The robot can be programmed for any welding task, thus reducing costs and the amount of work in progress. And it welds in half the conventional time. Other computer-controlled machines involved in the new production lines include aids to sidewall manufacture and assembly.

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# Manufacturing Automation 6

## Bright prospect for small-timers

**Assembly**  
IAN RODGER

AUTOMATION HAS penetrated many areas of the factory, but assembly lines remain, for most manufacturers, areas of great labour intensity. According to one estimate, the labour cost of manual assembly accounts for between a fifth and a quarter of the total labour cost for durable goods production.

Assembly is one of the most difficult areas to automate because it usually involves so many different functions like picking, placing and fastening—often in awkward sequences. Also, although taken for granted when people are doing the assembly, a great deal of visual and other inspection is involved at every step.

Thus, manufacturers have tended to shy away from attempting to automate assembly operations unless these are fairly simple, or involve big volumes so big investment in fixed automation plant can be justified.

Assembly automation is most advanced in the automotive and domestic appliance industries. It has tended to be applied most in spot-welding body panels of cars and washing machines, but also in large-volume assembly of complex components such as engines, clutches, fuel pumps, thermostats and door locks.

Not surprisingly, the assembly automation industry is a small fraternity, with fewer than a dozen major companies in Europe and the US. Among the leaders are the Gilson Automation subsidiary of Giddings and Lewis in the US, the

Comau subsidiary of Fiat in Italy, Renault in France, Bosch and Krause in West Germany, VS Technology and John Brown Automation in the UK.

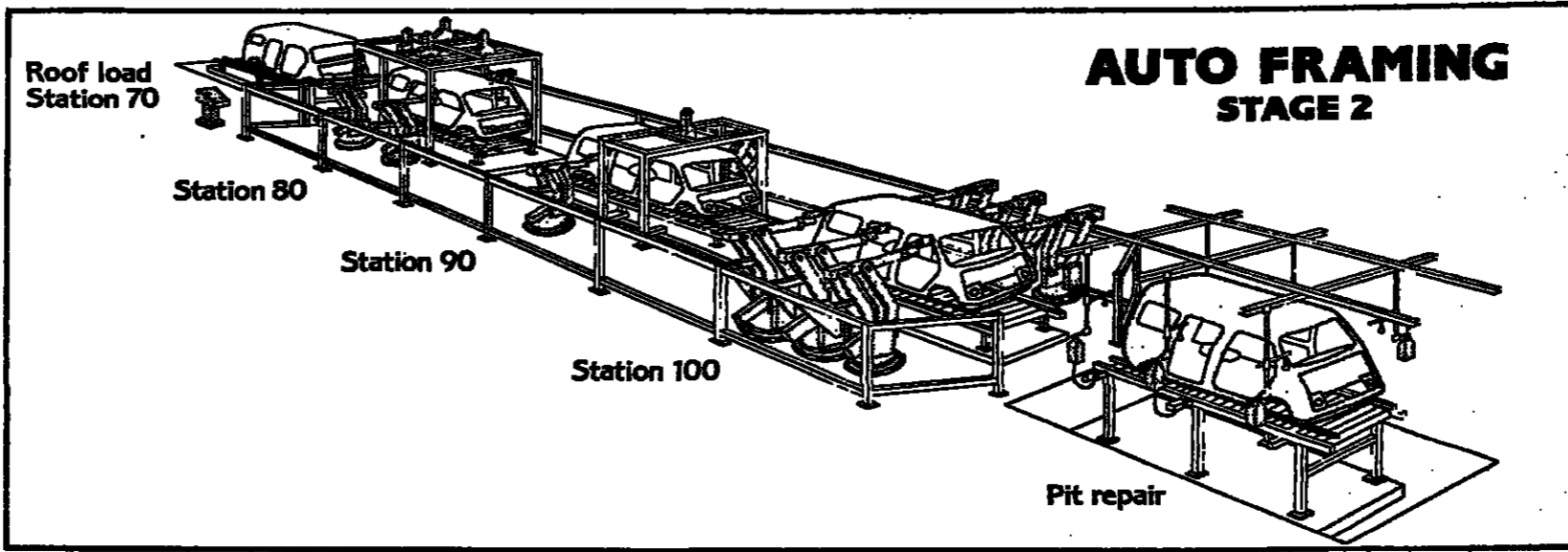
There are many other very small companies that, in many cases, have entered the business on the strength of one or two ideas. Until recently, growth in the industry has been limited by the number of potential applications for high-volume, fixed-assembly systems.

The emergence of new control, handling and inspection technologies makes the prospects for automating more varied, low-volume assembly operations much brighter in the near future. The availability at increasingly reasonable cost of vision systems, touch-inspection equipment, robots and programmable controllers all point in this direction. John Brown has designed and produced a system for assembling a family of seven small stapling machines for only £80,000.

The main automation companies are improving their abilities in this flexible automation field. Late last year Comau joined forces with Digital Equipment (DEC) of the US to develop automation systems. And last month, ASEA of Sweden acquired VS Technology of Britain.

ASEA, the leading robot supplier in Europe, said that VS had developed expertise in vision control, machine intelligence, automated adhesives technology and small parts assembly for the electronic and telecommunications industries, and that it would enable the group to supply more advanced systems throughout Western Europe.

Consulting firms are also getting into the act, claiming to have expertise in this area.



Manufacturing equipment worth £100m recently commissioned at Ford's Southampton plant in the UK includes 125 robots and two computer systems. TV cameras also check correct specifications and locate tool bar codes to control components. The Renault plant at Genk, Belgium, has also been automated. The main construction line involves 33 robots carrying out up to 1,300 welds to form sub-assemblies. The next line requires another 25 robots in tasks such as roof loading (left). The computer systems use a common data base, one for body construction and the other keeping track of the vehicle from point shop to delivery. Windcreens are fitted (bottom left) by direct glazing.



PROFILE: JOHN BROWN

BY IAN RODGER

## Fits and starts by UK leader

WHEN THE beleaguered John Brown engineering group decided in early 1984 to withdraw from the machine tool business, it held on to a small operation in it then called Wickman Automation.

Mr Allan Gormly, John Brown's managing director, said at the time that the group liked the idea of keeping a toe in the highly promising factory automation sector, and Wickman Automation, which is now called John Brown Automation, was showing considerable promise in the assembly automation field.

The operation was established in 1985 as an offshoot of the Coventry-based Wickman machine tool business when one person was assigned to make a rotary table assembly system for locks. It has grown in fits and starts, but has become one of the UK leaders in recent years, with a 70 per cent export component in its current £10m order book.

Turnover last year was about £5m and the company employs 140 people, 60 per cent of whom are skilled engineers. It has built systems for General Motors, Ford, Black and Decker and other appliance makers.

Last year, it won its biggest ever contract, a £2m system from the Soviet Union for assembling and testing combine harvester clutches. The system consists of 15 stations for assembling 24 components at a rate of one every 48 seconds.

It also won four major orders in the US worth a total of almost £4m, including three for automotive applications and one for assembling a kitchen sink waste disposal unit.

While its main sales are in high volume, repetitive automation systems, the company became interested in making more flexible systems several years ago. It has developed a programmable logic controller specifically for such systems, with the ability to check the

performance of work-stations and provide information on faulty components.

"We offer design assistance, too, with a view to reducing the costs of assembly," Mr Derek Harbour, managing director, says.

The company's problem today is that the assembly automation business in the UK is spread among too many small groups, none of which has sufficient volume to make profits consistently. John Brown Automation, for example, made a loss in 1983, a profit in 1984, broke even last year and should make profits this year.

Other leading UK groups such as Staden subsidiary of Hall Engineering and Fairley Automation, for which the Fairley Group is looking for a partner have not done well either.

## MAPs around factory floors lay out paths to survival

**Manufacturing Automation Protocol**  
JOHN DWYER

GENERAL MOTORS' manufacturing automation protocol (MAP), an attempt to create a standard way of sending data round a factory could save the industrial world according to one body of thought. But it will not do it yet. A MAP demonstration in Detroit proved how much work remains to be done. But GM has the right mix of dollars and determination to make it happen, and for the first time in the computer industry's life its industrial customers are dictating terms. From now on unless a supplier's equipment conforms to MAP, it will get little of the factory automation cake, put at \$100m by 1990.

MAP was born of irritation. GM has long had plans to automate its factories and last year spent \$90m on new plant. But by 1990 GM had grown tired of robot, conveyor and machine tool controllers and shop floor terminals that did not talk to each other.

Only 15 per cent of more than 60,000 devices now on GM's shop floor communicate beyond their own processes, and 40 per cent of investment was being wasted down to pay for interfaces to sort out this computerised Babel.

Even then, parts of production lines link to controlling screens and keyboards in the control room, so supervisors are faced with up to five sets of screens and keyboards from different suppliers.

The industry had no standards so GM decided to write some: MAP emerged in 1982. GM told its suppliers they would get no more sales unless they conformed.

With sales of \$90m, GM has so much buying clout the suppliers had to listen. But they were even more willing to co-operate once GM turned MAP into a world crusade. Now hardware and software suppliers are falling over themselves to emphasise how compatible their systems are with everyone else's. A few years ago they could not have cared less about the inability of their equipment to talk to anything else.

GM's idea is to run one cable round a factory into which every programmable controller, robot controller, machine tool controller and factory floor terminal plug, and which links to a factorywide supervisory manufacturing control system. It must not be based on Ethernet, which gets more inefficient—and less predictable—as the traffic increases. GM also dislikes Ethernet because it is bus-based, GM is used to broadband, which can carry speech and TV as well as factory-floor data. And, thanks to the 40m US homes connected to broadband community-access TV stations, this equipment is cheap and proven.

GM has been putting in experimental systems since the early 1980s. Its steering gear factory in Saginaw, Michigan, is a laboratory for MAP-connected systems in the rest of GM. The company is spending \$52m to set up a MAP-based supervisory factory there by 1987 which will have 40 manufacturing cells linked to the factory's Cadcam systems.

lished and the Esprit programme is funding two projects to complement MAP.

But MAP is no cure-all. In spite of its sole justification as a common method of factory communications, it is doubtful whether any of the US systems could talk to each other, how- ever well they work on their own.

**Compatible**

There are several versions of MAP. The standards on which MAP is based were largely unwritten four years ago and are still incomplete. The first time MAP was demonstrated, at the National Computer Conference at Las Vegas in July 1984, the six participants were linked over the first version, called MAP 1.0. The Saginaw Steering system uses MAP 2.0 and the most recent demonstration, at the Autofact show in November, used MAP version 2.1.

GM has said that these upgrades must be compatible one with another, allowing users an easy transition to a successor. But that will end with the definitive specification MAP 3, about a year away.

All these MAPs differ in such things as message format or running speed—five or 10 megabits a second—but further variants will be available which use either part or all of the OSI model. They may also differ in how much of the model is carried on an interface and how much is downloaded from a host computer for temporary residence on the interface board.

The cost is prohibitive, though curtailed "carrier-band" versions of MAP interfaces will be available this year and will probably be the choice of small companies which want to invest in MAP systems as a way of making it easier to add future capacity. Costs are from \$2,000 to \$10,000 per connection, due to fall to \$200 to \$500 when the VLSI chip versions of MAP appear in quantity.

**Timetables**

But even if a medium-sized manufacturing company was willing to put up with this expense and uncertainty and decided to put a MAP system in today, it could not buy it. Last November every board ever made by INTEL, the US company that made all the MAP 2.1 boards, was in Cobo Hall, Detroit, for Autofact.

MAP just is not around yet, even though companies which have to automate to stay in business cannot afford to wait.

What do they do? First Europeans should join the MAP-user group being run by Mr Tony Scarr at Cranfield Institute of Technology. Second, companies should sponge from a CIM supplier committed to OSI. Digital Equipment admits that all its MAP business for the immediate future will consist of handing out free advice in the hope of later sales. There are also small companies, like LDK of Aldershot, which have specialised in office communications interconnecting and are eager to get to grips with manufacturing problems.

### TALKING IS CHEAP

MAP may be all the rage, but a group of British companies believed that communications between different types of shop floor machines and computers is not as difficult or expensive as the MAP promoters make out. The group, led by Production Engineering Research Association (PERA), is attempting to prove that multiple computer-to-machine communication can be achieved through existing standard interfaces such as RS232, by mounting a demonstration manufacturing cell at the Autofact exhibition in London in June. The project calls for draw-

ing for six or seven components to be created in a CAD system, with the computer then sending instructions to a CNC lathe for machining and inspection. A robot cell will then take instructions from the lathe for sub-assembly. Among those participating in the project are IBM, TI Machine Tools, John Brown Automation, General Electric and Finlay Publications. Mr Peter Marshall, the project co-ordinator, of PERA, believes the job can be completed on time providing all suppliers can deliver on their claims.

IAN RODGER

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# Manufacturing Automation 7

PROFILE: HITACHI SEIKI

## Flexible system profits demand intensive use

HITACHI SEIKI, one of the top five Japanese machine tool builders, with turnover last year of ¥48bn, has set out to be one of the leaders in supplying flexible manufacturing systems (FMS) as well.

Mr Kikuchi Degawa, president, believes that the company is the most important Japanese supplier of FMS today, having sold some 30 systems since 1978, two of them abroad.

"However, my worry is that FMS will not be profitable for suppliers," he says. "It is certainly not profitable for us at the moment." On one contract, he recalls, the company managed only to recover its hardware costs.

Mr Degawa says the problem is that there are many things that cannot be foreseen when you are working with new technologies. "We know the goal, but not the way to get there," he says. The same is also true with customers. "While building an FMS, there are many discussions with the customer. The problem is that the contract value often does not seem to grow at the same rate as the requirements."

### Paybacks

Like many Japanese machine tool companies, Hitachi Seiki has used its own factory as a showcase for its technology. The plant at the Tokyo suburb of Abiko features three FMS installations, demonstrating different types of machining on various sizes of workpieces.

Two of the three systems have automatic tool supply systems; the one attached to the turning system is particularly innovative in that the tools are delivered via an overhead gantry.

Mr Degawa says one reason many FMS systems have not been successful is that companies do not use them intensively enough. Hitachi Seiki systems work around the clock, and have significantly

cut down the number of workers and machines involved in the related activities. However, the projected payback for the three systems are still not brilliant, varying from 2.6 to 4.1 years.

Although FMS is expected to become an important part of the company's business in the future, it is still relatively small. Machining centres account for 45 per cent of sales and semi-automated sales of special and very large machines. Seiki exports 20 per cent of its output, half of it to the US and a third to Europe.

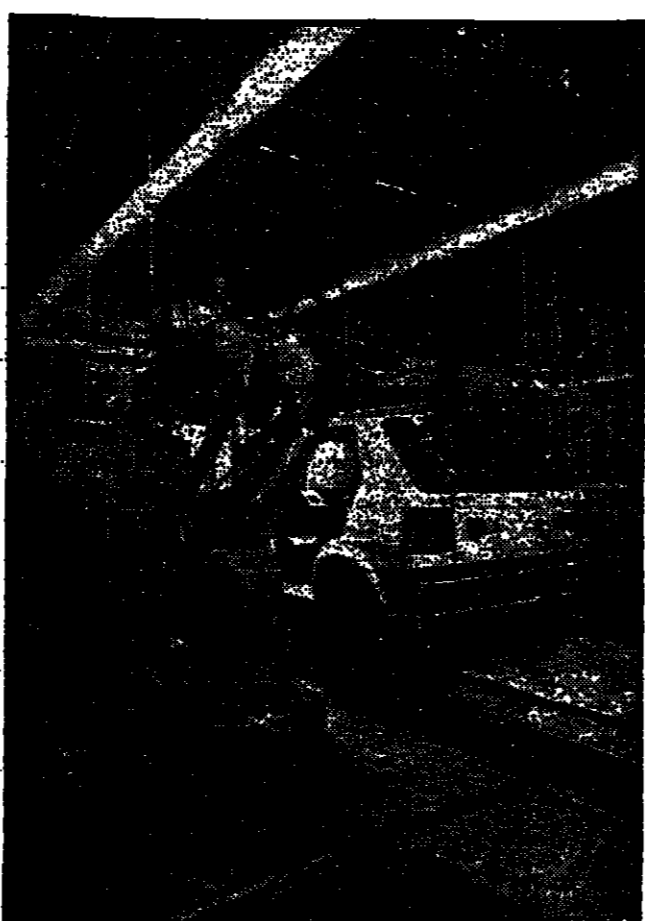
Despite its problems on FMS, this company of 1,800 employees is going through the most successful period in its history. Profit in the six months to September 30 nearly tripled to ¥57bn (¥4.2bn) compared with the same period last year, and the forecast for the full year is for profit of ¥125bn.

Hitachi Seiki was formed as a machine tool group in 1956 by the diversified Hitachi engineering group, but became independent when the big Japanese conglomerates were broken up after the war. Today, the shares are very widely held, and Hitachi has no share of it.

The company set up a small manufacturing operation in the US in 1986 (it employs 15 people) but it has been a headache. "The problem is that after we train people they leave," Mr Degawa says. In another step to protect its position in the US, the company has licensed Cincinnati Milacron, the US builder, to make its CNC lathes using components from Japan.

It would like to set up factories in Europe. "If we can find good partners," Degawa said. "In the past we had a few contacts with manufacturers, but nothing came of them."

Ian Rodger



Rear window assembly (above) at the Nissan assembly line in Murayama, Japan



A 15-station line for combine harvester clutch cover automated assembly being built by John Brown Automation in a £4m Soviet contract

PROFILE: KTM

## Joint ventures make up for weakness

BY IAN RODGER

IN 1983, Britain's trade and industry ministry carried out an urgent study of the country's rapidly disintegrating machine tool industry. The idea was to find out whether a restructuring plan could be designed that would have some chance of helping the industry avoid total collapse.

DTI officials quickly realised there was no longer any company or management team in the industry strong enough to lead a restructuring effort. So they decided that the best thing was to do nothing, leaving the industry to its own devices.

In the event, that was the best decision. Today, a handful of UK machine-tool builders have recovered from the slump of the early 1980s, and become internationally competitive both in price and technology.

Perhaps the most surprising case is Kearney and Trecker Marwin, the Vickers subsidiary that seemed in the early 1980s to be doomed.

Until 1982, KTM was the leading UK machine tool builder, at least in terms of technology. It specialised in big milling machines for the aerospace industry, transfer lines for the automotive industry and large milling machines for engineering.

Like many other builders, it was caught napping by the

Japanese advance on world markets in the late 1970s with machine tools using computer control (CNC) technology. While it was scrambling to catch up with the Japanese on standard machines, its aerospace and automotive markets also collapsed.

Turnover plunged from £26m in 1981 to £8m in 1984. A profit of £2m in 1981 has turned into heavy losses ever since.

A new managing director, Mr Mike Bright, was appointed late in 1984 and rationalisation began. The workforce was slashed from 1,000 to 600 by 1983 then to the current 365. Vickers made threatening noises about KTM not being a vital part of the group, and it looked as if it was only a matter of time before the Brighton-based company disappeared.

But Mr Bright set out a strategy for recovery and managed to win support from a non-interventionist DTI. The ministry asked Vickers to show patience, as KTM had technology valuable to the country, and could become highly successful.

Patience has certainly been required, but it appears to be beginning to pay off. Turnover bounced back to about £17m last year and the company has

begun making trading profits again. Mr Bright says the order book is healthy and that KTM will make profits after financing charges this year.

The key to this recovery was a recognition that the demand for specialised machines for the aerospace and automotive industries, which once accounted for about two-thirds of sales, would never return to prominence. Today, they provide only a fifth of KTM sales.

On the other hand, the demand for CNC machines and automated manufacturing systems built around them was likely to grow rapidly. The question was who was best positioned to succeed in these new markets. Mr Bright believed that machine-tool builders, with their knowledge of shopfloor machinery and practices, would have the edge over systems and software houses.

KTM had considerable know-how for making systems work, but it needed more expertise in electronics and project management. It also needed to add some smaller machines to build higher volume. The company has achieved these objectives through joint ventures with Mitsubishi of Japan for machines and Siemens of West Germany for controls.

"For three years, we have

been making up what the users thought was our weakness," Mr Bright says.

Almost all the group's sales are now of products it did not have five years ago, and 40 per cent of them are in systems. It has sold large and complex systems to Austin Rover, valve makers Pegler Hatterley, farm equipment group Case International and others.

"We are no longer talking about the leading edge of new technology, but proven and tried technologies in machines and software," Mr Bright says.

KTM has also rebuilt its export business partly through a licensing deal with an Indian company, Hindustan Machine Tool. Today, 28 per cent of turnover is exported, and the company has sold its new products in China, Belgium and France, as well as India.

Mr Bright says that, in terms of technology, KTM is now competing with the top 20 manufacturing systems companies. However, he believes that a collaborative venture with a European group is vital to securing its future.

"We have a responsibility to establish ourselves in international markets. That is a priority to achieve volume quickly. We hope to conclude an agreement this year."

PROFILE: GIDDINGS & LEWIS

## Numerical controls help recovery

BY IAN RODGER

GIDDINGS & LEWIS, based in Fond du Lac, Wisconsin, is one of the leading high technology factory equipment and system suppliers in the US.

The company's beginnings were in sawmill equipment in the mid-19th century, but it began making machine tools around the turn of the century when logging in Wisconsin declined.

Major expansion began after the second world war with the acquisition of a tool-making company and five machine-tool companies, including Douglas Fraser in Scotland which has become Giddings & Lewis-Fraser.

In 1986 the group began to widen its interests with the acquisition of Gilman Engineering and Manufacturing, a leader in assembly automation. This was followed by the purchase of printed circuit board-maker Basic Electronics, in 1978 and

Synder, a maker of transfer lines and special machines in 1981.

But expansion came to an abrupt end in 1982, mainly because the markets for machine tools and other G & L products slumped but also because the Canadian engineering group Amca.

G & L's main markets are in the automotive and defence industries. Its turnover reached a peak of \$290m in 1981 and then tumbled to \$110m in 1983 before recovering last year to \$210m. Mr Frank Jones, president, says that the group at least managed to avoid losses during the slump.

The machine-tool division remains the largest accounting for about half total turnover. The company makes horizontal machining centres and vertical lathes and produces its own numerical controls. It also sells control equip-

ment. Gilman, the assembly automation division, accounts for about a quarter of turnover and is the fastest growing part of the group, with sales expanding at about 25 per cent a year, mainly to the automotive industry.

Mr Jones estimates that 40 per cent of the group's machine-tool sales are made as part of system contracts, compared with only 10 per cent four years ago. "We have moved in that direction to get away from Japanese competition in standard machines," he says.

He believes the group's development of its numerical controls had been helpful. There are many things that need to be done that standard controls do not provide, such as adaptive control and sensing."

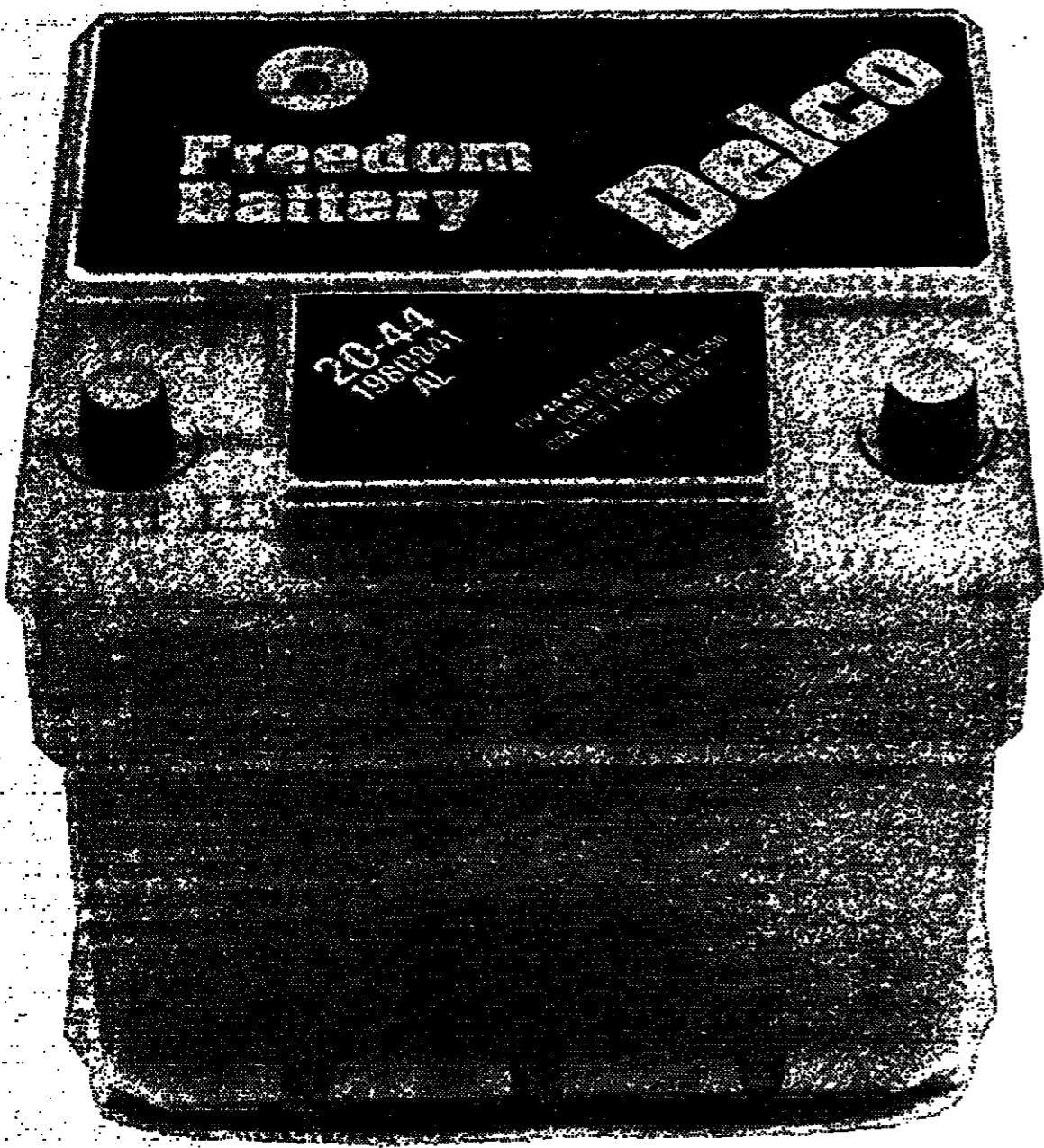
He says that more than 200 of the group's 2,500 employees work on electronics develop-

ment. Like the other big US factory automation groups such as Cross & Trecker and Cincinnati Milacron, G & L seeks to compete around the world in factory automation markets. To this end, it would like to set up an affiliate in the Far East, probably in China.

It is also changing Giddings & Lewis-Fraser, its Scottish subsidiary, from a maker of a limited line of machine tools into what Mr Jones calls the G & L of Europe. The Scottish company carried out one of the group's first flexible manufacturing system contracts, a £8m project for UK mining equipment maker Anderson Strathclyde, completed last year.

Mr Jones says there is still rationalisation to take place in the factory automation industry. "A lot of people have been hanging on in the hope that the economic recovery would make everyone well. But it has not, the recovery is over."

# The Delco Freedom Battery: Made maintenance-free. And made in Europe.



This is the automotive battery that's built with a completely new technology—with wrought lead calcium grids instead of the conventional type which is cast from lead antimony. It's not only much more durable, but it practically eliminates gassing and water loss. It never needs servicing or periodic charging.

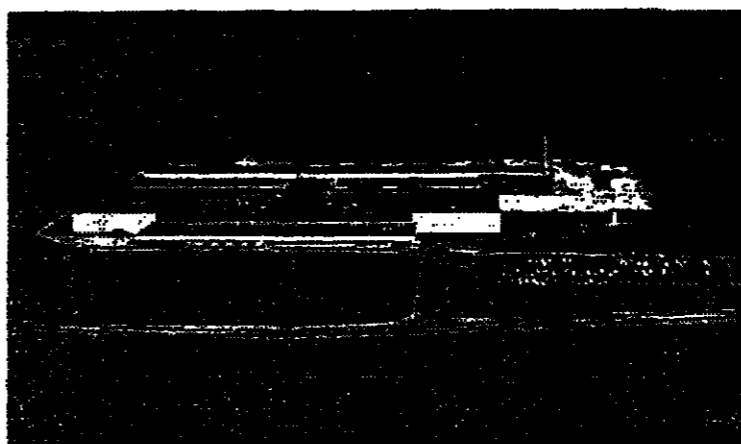
**Never add water**  
You never add water to the Freedom Battery. The top is heat-sealed on. And there's a lifetime supply of electrolyte sealed in.

**Easy handling**  
Since dealers don't have to handle acid, there is no electrolyte contamination. No improper activation. The terminals and case stay cleaner than those of conventional batteries. And Freedom is lightweight, too.

**Location flexibility**  
The Freedom Battery does not have to be in the front of the engine compartment. So car designers have freedom to choose its location.

**European manufactured**  
Best of all, it's built in Europe for the cars of Europe.

It's the Delco Freedom Battery. A remarkable automotive power source from Delco Remy, Division of General Motors, Milton Keynes, England; Russelsheim, W. Germany; Gennevilliers, France; Milan, Italy. A world leader in automotive electrical systems since 1896.



Our factory in Sarreguemines, France, is the world's newest and most modern automotive battery facility.

A world leader in automotive electrical systems.





**Oil and Gas**

**Worldwide**

**SECTION II - COMPANIES AND MARKETS**

# FINANCIAL TIMES

Monday February 3 1986

**TCB LIMITED**

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**Banking Services**

## Retail investors lie low

EUROBOND TRADERS are sending out search parties. The retail investor is missing and has not been sighted for days, writes Maggie Ury in London.

"Perhaps they've all gone skiing" was one hopeful remark. But a more likely explanation came from another dealer: "They do not like the coupons, they do not like the dollar."

The investors' absence is sorely felt. While the New York market has risen, Eurodollar bonds have been left far behind. Spreads - the difference in yield between Eurobonds and US Treasury bonds - have widened once more.

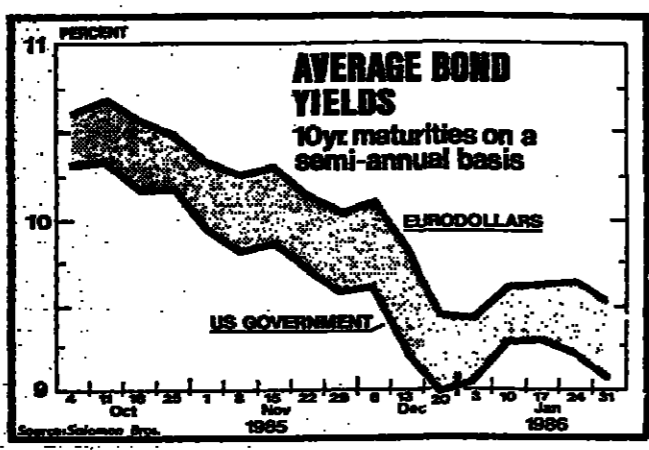
The chart shows average yields for 10-year bonds. But within the average of Eurodollar issues there is another divergence. US corporates, the borrowers that continental retail investors traditionally prefer, have been worse hit.

Many are now trading on yields much higher in Europe than they do in the US domestic bond market so they are unlikely to come to the Eurodollar market. On the other hand, the sovereign and supra-national names favoured by institutional investors have had a less bad time.

Issues such as the Council of Europe, Eurofima, and the European Community deal from the week before were moving. Even the Italy and Finland bonds, though tightly priced, were finding some demand. What interest there is comes from institutional buyers, many of which are Japanese and Middle East based, who want top names and longer maturities. So 18-year bonds have performed better than five-year paper.

The floater market is still in difficult shape, but Barclays Bank's perpetual issue last week was an outstanding success. Even though the terms were the tightest yet seen among the UK clearing banks' perpetual deals, with fees of only 20 basis points, and the issue was increased from \$500m to \$750m, the bonds were still trading well on Friday at around 98.94. This success could persuade the other clearers to follow suit.

Away from the dollar market there are more signs of life among investors. The Euro-Australian sec-



tor has been in better form enabling Goldman Sachs to increase Bank of Nova Scotia's issue from \$550m to \$600m, and last week's two deals were trading within fees.

The Euroyen market is also faring better. The discount rate cut in Japan, and rumours of even lower rates to come, combined with a currency which seems unworried by lower interest rates, have encouraged investor interest.

Canada's jumbo issue, far from overloading the market, seems to have enlivened it further. The deal, though tightly priced, has the advantage that it should be a liquid issue, and the name is well known. It also makes the other deals look better.

On Friday Nomura International launched an issue for Austria with a redemption amount in yen related to the yen/dollar spot exchange rate at maturity.

If the rate is ¥173.30 to the dollar, the redemption will be at par. If the yen appreciates beyond that, the redemption will be lower, and if the yen is weaker the redemption amount will be higher.

The French franc market seems unstoppable, in spite of worries about a realignment in the European Monetary System appearing again. The Renault deal last week was slipped in as an extra for the January calendar. Today bankers in Paris are to agree the deals for the February list with two borrowers, one foreign, one French, expected.

## Full-year losses at Amax top \$600m

**By Our Financial Staff**

AMAX, the US natural resources group which last month embarked on a big reorganisation of its metal businesses, has reported a preliminary unaudited net loss of \$103m, or \$1.56 a share, for the fourth quarter of 1985.

The latest figure compares with a deficit of \$259m a year earlier but, excluding special factors, losses are running at similar levels.

The 1985 quarter figure includes a charge of \$45m to provide for losses on tungsten and base metals properties and investments.

There is also a \$45m charge on the expected sale of the company's agricultural chemicals business, offset by a net gain of the same amount from the sale of the iron ore business.

For all 1985, the net loss was \$621m, including a \$350m second-quarter provision against losses on properties and investments. In 1984 the company lost \$238.3m, or \$3.86 a share.

Meanwhile, the company's subsidiary Amax Exploration has signed an agreement with Corfo, Chile's state development agency and the Chilean molybdenum company Molibdenos y Metales for the development and production of boric acid, potassium and lithium in the Atacama salt flats in northern Chile.

Total investment will be about \$200m, and annual sales are expected to reach \$130m. Amax will take a 63.75 per cent equity stake in the project.

Noranda, the Canadian mining, energy and forest products group, will add about \$261m (US\$42.9m) to its cash resources from the takeover of Tara Exploration and Development by Finland's Outokumpu mining group, writes Robert Gibbons in Montreal.

Noranda owns 48 per cent of Tara and Northgate Exploration 10 per cent.

## Wellington joins renegotiations

FIRST SWEDEN, now New Zealand, the spots of renegotiations of note insurance facilities in the Euro-markets is set to continue this week when New Zealand announces new terms on its \$1.5bn Citicorp-led facility, writes Peter Montagnon in London.

The deal was originally one of the first facilities pioneered as early as 1978 through its terms have been successively changed and the amount increased until it took its present form in 1984.

Paradoxically New Zealand is just in the process of drawing on the facility for the first time since the last revision. It has asked for bids on the issue of \$100m in notes.

But that is unlikely to stop it seeking to reduce the total amount of the deal as part of its efforts to cut the cost. The 10-basis-point annual commitment fee is also likely to be reduced.

New Zealand has this year embarked on a major debt refinancing programme to cut its overall borrowing costs. In January it launched both a Yankee bond issue in the New York market and a floating-rate note to replace earlier, more expensive debt for a total of \$500m.

Its decision to move also on the Euronote facility follows both the example of Sweden and a positive response to a much smaller recent \$100m deal for Air New Zealand, despite very tight terms which included a 5-basis-point commitment fee.

New Zealand will, however, be launching its deal while the jury is still out on the terms of Sweden's refinancing. Sweden had asked for replies to be in by last Friday to its request for better terms on a \$40m facility arranged in 1984 which is to be cut in half.

At the weekend, however, many were still outstanding through this is thought to reflect the tight reply deadline rather than any fundamental market opposition to the deal.

Elsewhere, Standard Life, the Scottish insurance company, has awarded the mandate for a £175m credit to Citicorp after a fierce bidding process which saw offers from a total of 30 banks.

That has led to even finer terms than the market initially expected with the margins set at 10 basis points for the first three years rising to 12.5 points for the next seven.

The deal is denominated in sterling (though it can also be drawn in dollars) and since it is transferable counts as a securities market operation under Bank of England regulations. That has led to the appointment of Samuel Montagu as UK sponsoring bank.

Standard Life thus joined Belgium last week in the ranks of borrowers now able to raise funds in the Eurocredit market at margins less than 1/2 per cent. Belgium's \$500m deal, led by Morgan Guaranty, is considered to bear very fine terms and represents a break with

tradition as it was not mandated to a Belgian bank.

One explanation for this is that Belgium syndicated a \$300m credit exclusively with local banks late last year, but the market is still watching carefully to see whether Belgian banks will support this deal too, amid some concern that, if they do not, syndication could be rather slow.

While East Germany is now concentrating on adjusting the terms of existing borrowings, the Soviet Union continues to raise money abroad. National Westminster Bank has won a \$200m equivalent mandate from Vneshtorgbank, its foreign trade bank.

The deal bears an interest margin of 1/2 per cent over eight years with repayments beginning after six, and funds will be made available in either D-Marks or Swiss francs.

NatWest also announced on Friday night that it had won a mandate from Thorn-EMI of the UK for a £200m, six-year credit facility although terms are not currently being disclosed.

Other sterling deals to emerge last week included a £75m uncommitted one-year bankers' acceptance facility for Sweden's Electrolux and a £50m, seven-year credit for Air Re/Aetna (UK). Both deals are led by S. C. Warburg, and the latter, which is designed to finance the borrower's purchase of the Tyndall Group from Globe Investments,

will carry a margin of 20 basis points.

Terms are meanwhile starting to emerge for the £4.29bn commercial bank financing for the Channel Tunnel. The deal, to which 31 banks have already committed in principle between £40m and £200m apiece, will bear an initial margin of 1 1/2 per cent over London Interbank Offered Rates (Libor) until the tunnel is complete in 1993. Once revenue starts flowing, the margin will drop to 1 per cent.

The life of the borrowing will be 18 years, but it is expected that the credit will be extensively refinanced in the bond market once revenue starts to flow.

Also, none of the bank commitments will become available for drawing before £650m of equity is in place, around the third quarter of this year.

The credit will go into syndication later this year with the five founder shareholders - Banque Indosuez, Banque Nationale de Paris, Crédit Lyonnais, National Westminster and Midland - playing prominent roles.

Romania has shelved plans to take out a \$150m, five-year syndicated credit under a mandate awarded in December to Kuwait Foreign Trading, Contracting and Investment Co (KFTCIC), a KFTCIC official told Reuters. Romania felt it would be able to get better terms if it waited several months before coming to the market, he said.

## Scandinavian Bank profits rise 17%

**BY NICK BUNKER IN LONDON AND WILLIAM DULLFORCE IN GENEVA**

SCANDINAVIAN Bank, the London-based consortium bank with assets of £3.7bn (\$4.6bn), has reported a pre-tax profit for 1985 of £14.2m, an increase of 17 per cent on the 1984 figure.

Improved earnings allowed the bank to double its general provision against loss, said Mr Garrett Bouton, the bank's managing director. But an increase in tax charges cut after-tax profits to £9.06m, down from nearly £11m the previous year.

The bulk of the gains in total revenue came from an increase in net interest income, combined with extra profits from foreign exchange dealing and from the Geneva-based investment management service operated by Banque Scandinave en Suisse (BSS), which is jointly owned by Scandinavian Bank and the Northern Trust Company of the US.

There were also particularly strong gains in Australia, where Scandinavian Bank acquired 100 per cent ownership of a local merchant bank, said Mr Bouton. But in London profits from Eurobond dealing had been approximately halved to £500,000 after record results in the previous year.

Banque Scandinave en Suisse, having absorbed losses incurred in 1981-83, almost doubled its net earnings to SFr 8.5m (\$4.2m). It plans to expand its investment management operations this year in Zurich and via a new company to be established in London.

**EUROBANKING TURNOVER**  
Turnover (\$m)

Primary Market	Switzerland	France	Other
1985	2,072.8	2,718.9	285.2
1984	2,365.2	2,658.5	245.5
Other	1,719.3	707.5	7.0
1985	92.3	98.5	30.5

Secondary Market	Switzerland	France	Other
1985	18,671.8	11,883.9	1,864.7
1984	22,715.4	13,285.9	1,983.3
Other	6,486.4	1,222.1	2,577.3
1985	6,322.2	3,195.1	2,165.5

Code	Switzerland	Total
1985	11,288.0	27,597.4
1984	12,954.0	29,227.7
Other	6,798.0	5,751.7
1985	6,912.2	6,675.0

Week to January 30 1986 Source: AFD

This announcement appears as a matter of record only.

New Issue

28th January, 1986

**U.S. \$100,000,000**

**Republic of Finland**

8 1/2 per cent. Notes due 1991

Issue Price 99 1/2 per cent.

Union Bank of Switzerland (Securities) Limited

Kansallis Banking Group	Postipankki
Citicorp Investment Bank Limited	Credit Suisse First Boston Limited
Deutsche Bank Capital Markets Limited	Dresdner Bank Aktiengesellschaft
EBC Amro Bank Limited	IBJ International Limited
Kleinwort, Benson Limited	Merrill Lynch Capital Markets
Salomon Brothers International Limited	Shearson Lehman Brothers International
Skopbank	Swiss Bank Corporation International Limited
S. G. Warburg & Co. Ltd.	Yamaichi International (Europe) Limited

NEW ISSUE

These Shares having been sold, this announcement appears as a matter of record only.

DECEMBER 1985

## ASKO DEUTSCHE KAUFHAUS

### Aktiengesellschaft

(Incorporated in Germany)

60,000 Non-Voting Bearer Preference Shares  
of DM 50 each

Credit Suisse First Boston Limited	Deutsche Bank Capital Markets Limited
Julius Baer International Limited	Girozentrale und Bank der österreichischen Sparkassen
Morgan Grenfell & Co. Limited	Morgan Stanley International
Swiss Bank Corporation International Limited	Union Bank of Switzerland (Securities) Limited

Banca-Württembergische Bank	Banca del Gottardo	Banca del Scorpione	Bank für Gemeinwirtschaft
Bank Getzwiller, Kurz, Bungeener (Overseas)	Bank Leu International Ltd.	Bank Leumi le Israel (Switzerland) AG	
Bank in Liechtenstein AG	Bank J. Voestel & Co. AG	Banque Française du Commerce Extérieur	
Bayerische Hypothek- und Wechsel-Bank	Bayerische Landesbank Girozentrale	Bayerische Verleihanbank	Berliner Bank
Berliner Handels- und Frankfurter Bank	Cazenove & Co.	Clariden Bank	Commerzbank
Compagnie de Banque et d'Investissements, CBI	Crédit Agricole	CSFB-Effektenbank AG	Dalwa Europe (Deutschland) GmbH
Dehrück & Co.	Deutsche Girozentrale - Deutsche Kommunalbank	DG Bank	Dresdner Bank
Emkita Securities	Finster Bank	Handelsbank NW (Overseas) Ltd	Georg Haack & Sohn Bankiers
Hestech & Cie	Hessische Landesbank	Landesbank Rheinland-Pfalz	Landesbank Saar
Lombard Odier International Underwriters S.A.	Merc, Finck & Co.	B. Metzler seel. Sohn & Co.	Norddeutsche Landesbank
Sal. Oppenheim Jr. & Cie	PaineWebber International	Pictet International Ltd	Rothschild Bank AG
Saratia International Securities Limited	Société Générale		Swiss Volksbank
Trinkaus & Burkhart	Verband Schweizerischer Kantonalbanken		Verkehrs- und Westbank
M. M. Warburg-Briekmanns Wirtz & Co.	Westdeutsche Landesbank	Yamaichi International (Europe)	

INTERNATIONAL CAPITAL MARKETS

US MONEY AND CREDIT

Treasury refunding will test positive mood

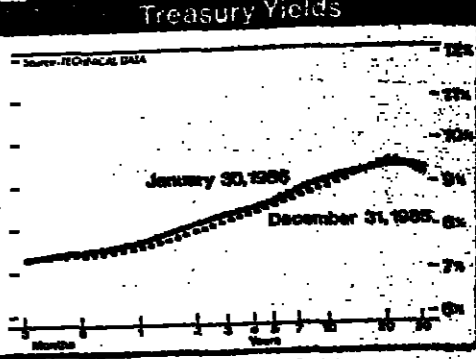
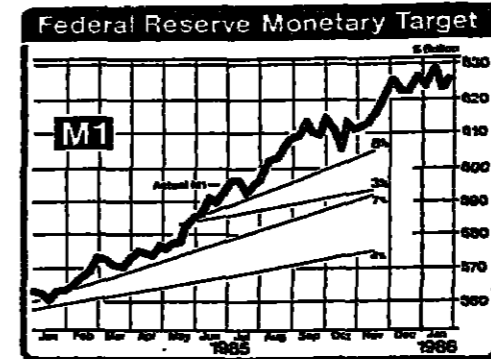
WALL STREET bond prices moved higher again for the third consecutive week in spite of little change in US money market rates.

US MONEY MARKET RATES (%) table with columns for instrument, last Friday, 1 week ago, 4 weeks ago, 12-month, and high/low.

US BOND PRICES AND YIELDS (%) table with columns for instrument, last Friday, 1 week ago, 4 weeks ago, and yield.

7 1/2 per cent or perhaps 7 1/4 per cent," says Mr Braverman, who argues that "the latest easing is probably in response to the consequences of the oil price slide, improved inflation prospects, Japanese easing moves, and to insure a healthier US economy."

However many Wall Street economists say they have not detected any shift in Fed policy and do not expect such a move soon. Among them Dr Henry Kaufman, of Salomon Brothers says, "The Federal Reserve Board will not ease monetary policy in the current environment, so short-term rates are likely to remain at or near current levels."



Salomon Brothers economists calculate that if the oil price decline holds, the consumer price index (CPI) and producer price index (PPI) could be as much as 0.8 per cent and 2 per cent lower respectively in 1988. That prospect could buoy bond prices, even as the chances of stronger real economic growth improve," says Dr Kaufman.

The markets' resolve will be tested this week by the record \$33bn quarterly refunding coming on Tuesday, \$7bn of ten-year notes on Wednesday — coupled with an additional \$1bn in foreign-targeted notes — and \$7bn of 30-year bonds on Thursday.

per cent that would be expected and largely discounted by market traders. Nevertheless it renewed hopes that the Federal Reserve Board may now have additional flexibility to ease.

Mr David Jones of Anbrey Lanston agrees, saying: "The reduction of Japan's discount rate was construed by some market participants as affording the Fed greater flexibility in seeking easier monetary conditions. It seems likely however that Fed officials will resist easing policy further in the near-term."

Second, Wall Street economists widely view the oil price decline as having a major positive impact on investor income expectations — and hence potentially helping long-term rates edge down further.

UK GILTS

Base rates seem safe but pitfalls ahead

THE GOVERNMENT has weathered another week without giving in to pressure for a rise in base lending rates.

A figure of £2.5bn for bank lending might cause more anxiety but the market is already discounting a good deal of this and still has been resilient for the last week.

All this would lead to a PSBR of £11bn, which is 2.75 per cent of GDP, compared to the 1.75 per cent targeted in the Medium Term Financial Strategy.

There are still some nasty pitfalls this week, however. The meeting of Opec ministers may yield no concrete results, but it would need little more than ominous noises to send the oil prices tumbling and with sterling.

Political worries were already at work in the market ten days ago, when index-linked gilts gained 1/4 points in one day, and they continued last Monday with further gains of 1/4 point in the index-linked sector.

That leaves the market untapped, but there is little pressure for funding in the current year, and the authorities have found a nice start on next year's funding with the second call on its latest issue.

George Graham

FT/AIBD INTERNATIONAL BOND SERVICE

Large table listing international bonds with columns for country, instrument, price, yield, and other details.

SAS SCANDINAVIAN AIRLINES SYSTEM DENMARK NORWAY SWEDEN. U.S. \$150,000,000. 10 1/8 % Notes due 1995. Includes logos and list of participating banks.

December 27, 1985. All of these securities have been sold. This announcement appears as a matter of record only.

STRAIGHT BONDS: Yield to redemption of the mid-price. Amount issued in millions of currency units except for yen bonds, where it is in billions. FLOATING RATE NOTES: US dollars unless indicated. Margin above six-month offered rate (if three-month is above market rate) for US dollars. CONVERTIBLE BONDS: US dollars unless indicated. Premium-parcentage premium of the current effective price of buying shares via the bond over the price of the shares.

Chemical Bank

INTERNATIONAL CAPITAL MARKETS AND COMPANIES

Fermenta forecasts jump in earnings

BY KEVIN DONE, NORDIC CORRESPONDENT IN STOCKHOLM

FERMENTA, the fast-growing Swedish biotechnology and pharmaceuticals group, expects to achieve profits in excess of SKr 1bn (\$133m) a year once it has completed the planned takeover of Sonesson, Leo and Gambro.

Subsidiaries Leo/Ferrosan and Gambro, but will sell off the Sonesson engineering operations. In an attempt to dampen criticism from financial analysts that too little is known about the new Fermenta group, the company has presented a series of forecasts for the group in 1986.

Comanche Peak hits snag over red tape

By Mary Frings in Dallas

A SLIP-UP over red tape has added to problems at the North Central Texas nuclear power plant, better known as Comanche Peak, which is already five years behind schedule.

NEW INTERNATIONAL BOND ISSUES

Table with columns: Issuance, Amount, Maturity, Av. life, Coupon, Price, Book Name, Offer yield. Lists various international bond issues from U.S. Dollars to Swiss Francs.

Petrofina lifts profits and dividend

By Paul Cheswright in Brussels

PETROFINA, the Belgian oil and energy group which has made an agreed bid for Charterhouse Petroleum of the UK, has reported net income for 1985 of Bfr 17bn (\$348m), or 10.1 per cent more than a year before.

People Express to buy PBA

BY OUR NEW YORK STAFF

PEOPLE EXPRESS, the fast-growing US cut-price airline, has agreed to acquire Provincetown-Boston Airline, a commuter carrier currently operating under Chapter 11 of the US bankruptcy code.

People Express' relatively recent strategy of building a nationwide network to compete with other major US domestic carriers.

PBA was once the nation's largest airline with major routes in the north east and Florida, but filed for protection from creditors in March last year.

Growth slows at Club Med

By David Housego in Paris

CLUB MEDITERRANEE, the French-owned holiday group, registered a slowdown in profit growth last year.

Swedish insurance group falls into SKr 310m loss

BY DAVID BROWN IN STOCKHOLM

SKANDIA of Sweden, one of Europe's largest insurance companies, plunged into a loss before tax and extraordinary items of SKr 310m (\$41.3m) last year compared with a profit of SKr 354m in 1984.

Skandia's board has recommended an unchanged dividend of SKr 6 per share and has proposed a five-for-one share split.

Work on the first unit stopped last week and 100 men were laid off, although another 300 were transferred to unit two.

Mr Jim Boyle, Public Counsel for the Texas Public Utility Commission, said the stoppage was "a very sad occurrence, because every day the plant is delayed costs \$1m in interest."

Five years ago Texas Utilities took over the quality assurance programme at Comanche Peak from Brown & Root, the main contractor.

In January last year Federal inspectors reported so many flaws in the plant's design, construction, management and inspection that all operational licence hearings were suspended.

TRANSAMERICA, the US group which last week revealed plans to focus on financial services and divest its other interests, is making a \$175m share issue of which 20 per cent is to be sold in Europe.

Advertisement for Banca Nazionale dell'Agricoltura S.p.A. featuring a logo, text: 'A\$ 40,000,000 15 1/8 per cent. Depository Receipts due 1991', and a list of international banks.

Advertisement for Syntex (U.S.A.) Inc. featuring the Syntex logo, text: 'Japanese Yen 20,000,000,000 6 5/8% Guaranteed Notes due 1993', and a list of international banks.

UK COMPANY NEWS

Wates City signs £56m debt rescheduling plan

BY MICHAEL CASSELL, PROPERTY CORRESPONDENT

Wates City of London Properties, which owns a major portfolio of investment properties in the Square Mile, has signed a £56m debt rescheduling agreement.

The following companies have notified dates of board meetings to the Stock Exchange. Such meetings are usually held for the purpose of considering dividends. Official indications are not available as to whether the dividends are interim or final and the sub-dividing advice below is based mainly on last year's timetable.

BOARD MEETINGS table with columns for Company Name, Date, and Notes.

Sun Alliance business mixed

Sun Alliance Insurance Group has announced the complete integration of its life operations with that of Phoenix Assurance which was acquired 18 months ago, incorporating combined funds of £3.7m.

under the Sun Life name. The Phoenix name will be retained for the specialist products in which it was a leader—individual term, group life and PFI. There will be rationalisation of product range during 1986 under the Sun Alliance umbrella.

showed strong growth during the year with premiums up by more than a third. The group has announced new revenue bonus rates for 1986 for its main classes of business. The bonus rate applicable to the basic benefit has been reduced from 24 per cent to 23.75 per cent.

Global profit 14% ahead in first half

Global Group, meat and meat products concern, reports turnover up by 59 per cent and pre-tax profits higher by 14 per cent in the six months to November 30 1985. The results were achieved despite what the directors describe as difficult trading conditions in some of its main markets.

Turnover for this USM-quoted company rose from £11.13m to £17.65m. Pre-tax profits were £175,000 (£154,000) and with a tax charge of £29,000 (£27,000) and minorities taking £2,000 (nil) the earnings per 10p share came out at 2.3p (1.9p). The interim dividend is unchanged at 1p.

Changes in company share stakes announced over the past week include: United Spring & Steel Group—director B. Fenwick-Smith purchased 1,835,000 shares (12.06 per cent).

J. & J. Dyson rises 89% to £0.3m

An 89 per cent increase in pre-tax profits has been achieved by J. & J. Dyson, Sheffield-based maker of refractory materials and articulated trailers, in the six months ended September 1985.

The interim dividend is held at 2p, but the directors say that if the company's optimism in the future is justified, consideration will be given for an increase in the final. In 1984/85 an unchanged 2p final was paid when total profits were £727,707 (£598,321).

Haynes up midway and prepares for further expansion

Haynes Publishing Group, Somerset-based book publisher and retailer, has lifted pre-tax profits in the six months to end-November 1985, by £14,000 to £80,000.

The directors are stepping up the interim dividend by 1p to 5p to reduce disparity. A total of 13p was paid in 1984/85 when profits reached £1.7m. The payment is stated net earnings per 20p share of 10.26p (£0.2p).

being incurred due to changes being implemented to prepare foundation for further growth and expansion. In the second half more management and organisational changes will occur, Mr Haynes reports. It is intended to expand the editorial function and to double the company's warehousing capacity.

At the same time, sales managers for the east coast and the traditional book trade have been appointed, which will result in a further increase in expenditure in the short term, but it is planned that this will lead to increased sales and profitability in late 1986/87.

THE BANK OF NOVA SCOTIA (A Canadian Chartered Bank) £100,000,000 Floating Rate Debentures 2000 Issue Price 100.10 per cent.

FINANCIAL DIARY FOR THE WEEK table listing various company meetings and events.

SHARE STAKES table listing changes in company shareholdings.

EQUITIES table listing various stocks and their prices.

FIXED INTEREST STOCKS table listing fixed interest securities.

RIGHTS OFFERS table listing rights and offers for various companies.

PENDING DIVIDENDS table listing upcoming dividend payments.

Cattle's (Holdings) p.l.c. Increased and Extended Facilities of £40,000,000. Provided by THE ROYAL BANK OF SCOTLAND PLC, MIDLAND BANK plc, THE FIRST NATIONAL BANK OF CHICAGO, A P BANK LIMITED, KLEINWORT, BENSON LIMITED, AUSTRALIA AND NEW ZEALAND BANKING GROUP LIMITED, SINGER & FRIEDLANDER LIMITED, COUNTY BANK LIMITED, MORGAN GRENPELL & CO LIMITED, WESTPAC BANKING CORPORATION.

HAMBRO INTERNATIONAL BOND FUND NOTICE OF DISTRIBUTION. For the accounting year ended 31st December 1985, a distribution of US\$11.50 per 10 shares is payable from 14th February 1986.

Granville & Co. Limited Member of The National Association of Security Dealers and Investment Managers. 8 Lovat Lane London EC3R 8BP Telephone 01-421 1212

The Princess Alice Hospice. We care for the terminally ill of all denominations, and urgently need donations to assist us with our running costs of more than £400,000 p.a.

FINANCIAL TIMES STOCK INDICES table showing various market indices.

F.T. Share Information table listing various shares and their prices.

LADBROKE INDEX table listing various shares and their prices.

The Princess Alice Hospice. We care for the terminally ill of all denominations, and urgently need donations to assist us with our running costs of more than £400,000 p.a.



Johnnie Walker has been gaining new ground in recent years.

It is the world's best selling Scotch Whisky.

Things are very much on the move here at Guinness too.

Last year UK sales of draught Guinness showed a significant increase. A considerable achievement in a static market.

And our group's beer exports reached an all time high. (In 1984 we accounted for almost one third of the beer exported from the UK.)

We are confident that our merger with Distillers will be an extremely healthy one. And not just for our shareholders.

Britain as a whole, and Scotland in particular, have good reason to welcome the move. Scotch Whisky is one of this country's leading exports. And as such it employs over 16,000 people.

Yet Scotch Whisky is under attack from Japanese Whisky. From American Whiskey. And from Canadian Whisky.

It is strong foreign competition. And Britain must marshal its forces if it is to put up a fight.

Our merger with Distillers would bring together two of the most prestigious drinks companies in Great Britain.

It would create an arsenal of more than a dozen world famous drinks brands.

It would marry Distillers' expertise in spirits production and marketing, with our renowned flair for advertising and brand development.

And it would give Britain a representative amongst the "big boys" of the international drinks business.

The Guinness Distillers alliance deserves your support.

It is not only good news for J. Walker Esq. It is good news for John Bull.

## GUINNESS PLC

Guinness and Distillers. A stroke of genius.



# WITH GUINNESS HE SHOULD MAKE EVEN GREATER STRIDES.

This advertisement is published by Morgan Grenfell & Co Limited and The British Linen Bank Limited on behalf of Guinness PLC. The Directors of Guinness PLC are the persons responsible for the information contained in this advertisement. To the best of their knowledge and belief (having taken all reasonable care to ensure that such is the case) the information contained in this advertisement is in accordance with the facts. The Directors of Guinness PLC accept responsibility accordingly.

SOURCES: Impact International, H. M. Customs and Excise, Scotch Whisky Association, Guinness Annual Report 1985, Guinness Sales Records.

# THE MANAGEMENT PAGE

EDITED BY CHRISTOPHER LORENZ

**JACQUES MARGRY** had a strong claim to first refusal when the US owners of Parker Pen decided to sell up and quit the pen business last July. While the Wisconsin-based parent had stumbled from crisis to crisis, he had resolutely sustained the British and European operation's success record from his base at Newhaven, Sussex.

But Dunhill and Gillette—powerful players at the top and bottom ends of the market—were showing a strong interest in the world's leading quality writing instrument maker. Pilot of Japan was also believed to be prowling. Margry had to move nimbly to set up his planned management buy-out.

Not even sure whether he could raise the \$100m he would need, he first hand-picked his team of prospective colleagues from the group's management around the world.

"I wrote and asked them if they were prepared to mortgage themselves up to the hilt and work 12 or 14 hours a day. 'If you have the best team in town,' it greatly increases your chances of winning whatever game you play," he reflected.

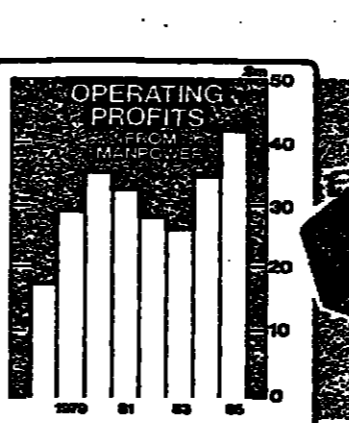
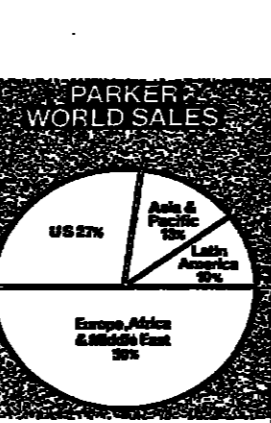
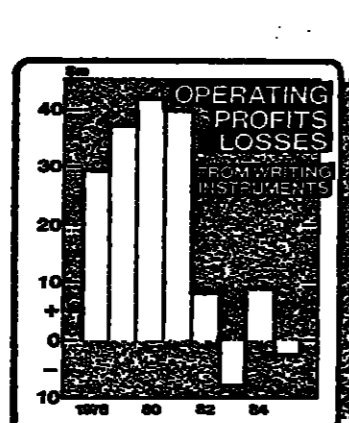
With the team in training, Margry's advisers on buy-out strategy, Cockman, Copeman, pinpointed Schroder Ventures as the financing operation which was ultimately to involve Bankers Trust, Chemical Venture Capital, Electra Investment Trust and others in taking an equity stake.

The deal was signed last Friday, leaving the former US management to run its Manpower temporary help business, and bringing Parker Pen to its new base only a few miles down the coast from Dover, the ancestral home of the Parker family.

Margry, aiming to restore the far-flung group's fortunes, is taking a low profile approach. He says his ultimate aim "almost a necessity" is a Stock Exchange listing, but that demands a deal of concentration on the job in hand. "We need to establish a track record rather than simply make claims."

The basic building blocks appear to be in place. In the past five years the company:

- Has invested \$20m in automated manufacturing facilities. About half the total was spent at Newhaven, with the rest distributed around other main plants at Jamesville, Wisconsin, the works near Paris and assembly plants in South and Central America. More than 10 other plants have been closed.
- The product range has been reduced from more than 500 to 100.



## Parker tests up-market potential

Christopher Parkes on plans for the pen company following the management buy-out from its US parent

① The workforce has been cut from 8,755 to around 2,500. Under the sales agreement Margry has announced a further 130 redundancies in the US, bringing the American workforce down to about 440—half the level of a year ago. And 20 jobs are to go in West Germany.

② Now the company has been freed from the burdens of the expensive and costly corporate administration and its grand offices in the US. Most important, however, it has been liberated from living under the shadow of the dollar.

③ "We do only 27 per cent of our business in the US. The result has been that the company results were more and more exposed to currency translations," explains Margry. Good results in foreign currencies were being diluted into losses on conversion to dollars.

④ Even so, Parker is still hobbled with the results of five years of changes of management and strategy and increasing losses from the US business which have left the company with only a 3 per cent share of the total US writing instrument market and about 17 per cent of the trade in quality pens costing \$3 or more.

⑤ Margry estimates that A. T. Cross, the main competitor in America, has 11 per cent of the overall market and some 50 per cent of the crucial \$3-plus trade—an exact parallel with Parker's strong position in the British market.

⑥ It is in no doubt that Cross's success stems from its stubborn adherence to a limited range of high-priced product and

admirable resistance to the apparent attractions of the battlefield at the bottom end of the market.

Parker's success in Europe can be attributed to its quality image—in the Cross mould—and its failures in the US partly to its attempts to go down market and the consequent neglect of its traditional strengths. Managers of the American business were obsessed by size. They saw that 60 per cent of the US pen trade was in pens costing less than \$3 and became preoccupied with winning a share.

Parker's expertise was in quality production, Margry says, and the management underestimated the difficulties of adapting its techniques and style to produce and market low-price writing instruments. "The trials cost a lot of time, money and effort," he says,

tion of what this may mean to Parker.

The company suggests that wide in volume terms, sales of quality pens account for perhaps 8.1 per cent of the total UK writing instrument market, this trade accounts for some 18 per cent of the total by value.

Broken down further, Market Assessment's figures indicate that the quality trade accounts for 28 per cent by value of the total retail market for fountain pens, 18 per cent for reliable ballpoints, 12 per cent for rollerballs and 15 per cent for mechanical pencils.

The natural consequence of the revival in the top end of the market has been greater interest among all manufacturers. Imports of fountain pens in 1984, for example, were worth about \$5.7m, compared with \$1.5m in 1981.

A. T. Cross, Waterman and Elysee are competing strongly in the valuable sector for pens costing between £20 and £100, where Parker still holds sway with Sheaffer in second place.

Non-Food Markets, September 1985, available from Market Assessment Publications, 2, Duncannon Terrace, London N1 8BZ. Annual subscription £290.

determined to leave the disposable pen business to the others and re-establish the Parker name where it belongs alongside Cross.

The turmoil which has led to the management buy-out began at the turn of the decade, when Parker was battling in every sector of the market—and losing on most fronts. The chief executive was fired and George Parker, grandson of the founder, took control.

In January 1985, James Peterson, a marketing man from R. J. Reynolds, the US tobacco company, took over from Parker with the declared aim of making Parker Pen "a highly competitive market-driven organisation."

He started the process of centralisation and rationalisation, hacking through the ranks of the 40-odd advertising agen-

cies which serviced the sprawling group, thinning the product range and shutting factories.

Then he cut prices in a bid to regain market share and imposed a global marketing plan at emulating the international success of products like Marlboro cigarettes. By 1984 the policy appeared to be working. Company research showed Parker had a dominant share in six of the 10 biggest markets in the world.

But the recovery was a mirage. Prices were too low and earnings fell stubbornly short of Peterson's target of a 15 per cent a year growth rate. The Parker family went head-bunting again. They turned to Mitchell Fromstein who had joined the group after it acquired his Manpower temporary help business.

He quickly unravelled many of his predecessor's policies, halted production of throwaway pens and returned the company to its roots in the quality business.

"The initial turnaround steps have been taken. The company is now producing a profit and what is required is for a tight management team which has been running the successful side of the company to put some of their own assets at risk and take an entrepreneurial approach," Fromstein says.

As part of the deal, Margry and his team have undertaken to do all they can to keep the US production business going. Peter Kibble, formerly vice president for Asia and the Pacific region, has been assigned temporarily to take control in America. Kibble, who joined the company from Sheaffer of the US in 1979, was instrumental in creating the Targa line, Sheaffer's most successful range.

He will, however, take his lead from the Newhaven board, Margry has firm ideas on his global strategy. First, Parker will make and sell only quality writing instruments. The main board will set prices and control packaging, product range and design. All other functions will be decentralised.

"World managers will decide whether to operate defensively or attack according to their local circumstances," says Margry. Each market in Europe is different, and there is no single competitor with a trans-European grasp. In France, Parker faces Waterman; in West Germany it is Mont Blanc,

owned by Dunhill, and the closest competition in the British market is provided by Sheaffer.

Margry has firm ideas on product strategy, and turns his face firmly against innovation for its own sake. The company's speciality since its earliest days has been refinement. Founder George Parker based his business on "building a better pen." His first success was the Lucky Curve leak-free ink feed.

In the 1920s the company sold millions of Durefold pens on the merits of durability. A stylish hooded nib was the only apparent advantage of the renowned Parker 51.

More recently, the company has further demonstrated the benefits of building a better pen and still insists that being first is not necessarily essential in the writing instrument market.

Parker was the last major company to produce a ballpoint pen, coming in 11 years after Bic had ironed out most of the early problems. It held up its move into roller balls—a Japanese invention—until 1983. By then it had worked for five years and spent \$3m on research and development.

Within a year the Parker Roller Ball was brand leader in the UK market, sharing the top rankings already earned by the company's reliable ballpoints, mid-price and top-range fountain pens and poppable pencils.

The refinement process continues in both products and marketing. Pastel coloured barrels have recently been introduced in the lower-priced Vector range. The more costly ranges will be extended later this year with new models and finishes as Margry probes for new niches in the market.

"In the past the company used a shotgun approach to marketing, then the rifle. Now we are using the laser," he says.

There is a strong market for "designer" pens, Parker has his own premium—even solid gold—models competing with the Dunhills, Cartiers and Du Ponts, although Margry clearly feels ventures in this area can be overdone. "We have counted 80 recognisable designer products in Italy."

The cachet of the fountain pen is still strong in Europe, particularly France. But in the US, where this trade is worth almost \$600m a year, Parker's share accounts for only 13 per cent of its total business.

Health considerations are ruling out alcohol, cigars, cigarettes and lighters from this sector. Givers have to consider the rising force of women executives which rules out traditionally male-biased presents. A pen offers no health hazards, no sexist offence, Margry is focusing his laser.

**Business Courses**

Swap financing, Brussels, March 10-12. Fee: non-members \$57/£4,000; members \$57/£2,000. Details from Management Centre Europe, rue Caroli 15, B-1040 Brussels. Tel: 32/2/516.19.11 Telex: 218.37.

Statistical information sources for business planning and marketing, Coventry, April 8-9. Fee: \$85 + VAT. Details from Arden House, Conference Centre, University of Warwick, Coventry CV4 7AL. Tel: 0203 523051/523251. Telex: 31494.

Principles and practice of marketing, Bradford, April 8-12. Fee: \$750. Details from Mrs Dorothy Dufaux, University of Bradford Management Centre, Post Experience Programme, Herton House, Kettleby Road, Bradford, West Yorkshire. Tel: 0274 42269 ext 264.

The accountant in management, Birmingham, March 10-14. Fee: £1,050. Details from Rosemary Lee, Registrar—International Skills, London Business School, Sussex Place, Regent's Park, London NW1 4SA.

Improving purchasing performance, St Helens, March 17-19. Fee: £220 plus residence. Details from Mrs M. Ballard, The Administrative Officer, School of Management Studies, Water Street, St Helens, Merseyside WA10 1PX. Tel: 0744 33766.

Continuity and succession planning: developing tomorrow's leaders, Brussels, April 1-4. Fee: non-members \$77/£7,000; members \$57/£2,000. Details from Management Centre Europe, rue Caroli 15, B-1040 Brussels. Tel: 32/2/516.19.11. Telex: 21.917.

The senior executive programme, Bromley, May 11-23. Fee: £1,900. Details from the course secretary, Sunridge Park Management Centre, Bromley, Kent BR1 3TF. Tel: 01-460 8565/8667.

Buying in technology for business growth, London, March 20. Fee: ESC members £147.20; non-members £172.50. Details from European Study Conferences, Kirby House, 31 High Street East, Uppington, Kent, LEICESTERSHIRE LE15 5PY. Tel: 0572 82711. Telex: 341382 EURCON G.



FINANCIAL TIMES CONFERENCES

# Pensions in 1986

London, 17 & 18 March, 1986

The 1986 Social Security Bill proposals on pensions promise very radical changes with important opportunities and consequences for corporations, for individuals and for the pensions industry itself. The programme for the conference, the most important FT pensions forum for many years, includes papers by:

- |   |   |
|---|---|
| <b>The Rt Hon Norman Fowler, MP</b><br>Secretary of State for Social Services                     | <b>Mr E A Johnston, CBE</b><br>Government Actuary   |
| <b>Mr Michael Meacher, MP</b><br>Opposition Spokesman on Health & Social Security                 | <b>Lord Harris of High Cross</b><br>General Director<br>Institute of Economic Affairs   |
| <b>Mr Derek E Fellows</b><br>Chief Actuary<br>Prudential Assurance Co Ltd                         | <b>Mr Maurice Oldfield</b><br>Group Pensions Executive<br>Allied-Lyons PLC  |
| <b>Mr Parry Rogers</b><br>Chairman, Institute of Directors<br>Chairman, Plessey Pension Trust Ltd | <b>Mr Edgar Palamountain</b><br>Chairman<br>The Wider Share Ownership Council<br>Director<br>The Esmée Fairbairn Charitable Trust |
| <b>Mr Tom Heyes</b><br>Vice President, NAPF<br>Head of Investments Dept<br>ICI PLC                | <b>Mr Dryden Gilling-Smith</b><br>Managing Director<br>Employee Benefit Services<br>EBS (Management) Ltd                          |
| <b>Mr Dennis Blair</b><br>Managing Director<br>Wellbeck Pension Services Ltd                      | <b>Mr David Wilkie</b><br>Partner<br>R Watson & Sons  |

A FINANCIAL TIMES CONFERENCE in association with PENSIONS MANAGEMENT

**Enquiry Form**

## Pensions in 1986

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In Virginia We Found A Way To Bring You Today's News From Outer Space.

Nearly three million readers reach for *The New York Times* every day to find out what's going on in the world. That makes it one of America's largest selling newspapers.

Few of its readers realize, however, that a small company in Virginia plays a major role in helping the paper get the latest news into the hands of its readers.

*The Times* has a state-of-the-art printing set up which has been fundamental to its growth and success. The national edition is put together each day in New York City. Then, thanks to a high speed laser scanner designed in Virginia by Crosfield Data Systems Inc. (formerly known as LogEscan Systems Inc.), each page is transmitted to a satellite 22,300 miles above the earth and the information is then beamed to printing plants in five states across the nation.

But this is only one of Virginia's success stories in the rapidly growing field of communications.

What makes it such a good place for these companies? Virginia has one of the best educated work forces in the country. It's a right-to-work state. And so well managed, it has earned a AAA bond rating.

If this sounds good to you, contact Denis Ruffin, Director for Europe, Virginia Department of Economic Development, 479 Avenue Louise, BTE 55, B-1050, Brussels, Belgium. Telephone: 648-6179. Telex: 26695.

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APPOINTMENTS

Sir David Nicolson to head VSEL

Sir David Nicolson, former chairman of BTR, has been named as the new chairman of VSEL CONSORTIUM...



Sir David Nicolson, chairman of VSEL Consortium

IMI Yorkshire Copper Tube, Menzies, a subsidiary of IMI. He succeeds Mr Peter Fisk...

Sir Gerard Vaughan, the former Minister for Health and MP for Reading East, has become chairman of PRIVATE MEDICAL CENTRES...

Mr David Wood has been appointed group managing director of SODASTREAM...

APRICOT COMPUTERS has appointed Mr Stuart Hunt as group financial director...

HENRY ANSCHUTZ HOLDINGS has appointed Mr Alfred Slinger as a director...

Mr Roland Bellinger has been appointed a director of Icare International, a subsidiary of SMITHS INDUSTRIES...

Mr G. P. F. Hart has been appointed company secretary to the NATIONAL FREIGHT CONSORTIUM...

Mr Leslie Warman, a senior executive in the corporate finance division of LLOYDS BANKING GROUP...

Mr Michael Kettle has been appointed managing director of the HOUSE OF CAMPBELL, Scottish subsidiary of the group...

Mr Andrew Noble, chairman of the British Retailers Association, has been appointed managing director of Debenhams...

Mr Brian J. Swindells has been appointed managing director of...

Mr John Trumper, director of Trumper Bros, Birmingham, has been elected president of the NATIONAL FEDERATION OF PLASTERING CONTRACTORS...

Mr Neville E. Searle, managing director of WIMPEY LABORATORIES since 1973, has been appointed deputy chairman of the board of WIMPEY...

The BRITISH AIRPORTS AUTHORITY has appointed Mr William Shaw as corporate finance director from April 1. He is finance director with De La Rue Company...

REDDISH SAVILLES (a member of the Brent Chemicals International Group) has appointed Dr Brian Riley technical director, chemical sales. He was a technical manager...

FT UNIT TRUST INFORMATION SERVICE

AUTHORISED UNIT TRUSTS

Table listing various unit trusts with columns for name, manager, and other details. Includes sections for 'Authorised Unit Trusts' and 'Authorised Unit Trusts (continued)'.

FINANCIAL TIMES SULTANATE OF OMAN SURVEY. This 12-page Survey has been reprinted as a booklet and is now available at the price of £5.00...

F.T. CROSSWORD PUZZLE No. 5,938. A crossword puzzle grid with numbers indicating starting positions for words.

ACROSS and DOWN crossword puzzle clues. Includes clues like 'Wood reserved for emergency sprays?' and 'More offensive sort of soldier'.

Contracts and Tenders INVITATION FOR BIDS (IFB). LOAN No. 1404-ET. The Provisional Military Government of Socialist Ethiopia...

Public Notices INVESTIGATION BY THE MONOPOLIES AND MERGERS COMMISSION. Proposed merger of The General Electric Company plc and The Plessey Company plc...

Company Notices USD 300,000,000 CAISSE NATIONALE DES TELECOMMUNICATIONS. Floating Rate Notes due 2009...

CLASSIFIED ADVERTISEMENT RATES. Table showing rates for different types of advertisements: Commercial & Industrial, Residential Property, Business, Investment, etc.

Vertical text on the left edge of the page, including 'February 3 1986', 'TOPNER LOW', and 'Business'.

AUTHORISED UNIT TRUSTS & INSURANCES

Table listing various unit trusts and insurance companies, including names like 'Oppenheimer Fund Mgmt Ltd', 'Pearl Trust Managers Ltd', and 'Prudential Unit Trust Mgmt Co'.

Table listing various unit trusts and insurance companies, including names like 'Allied Dunbar Assurance Plc', 'Confederation Life Insurance Co', and 'Continental Life Insurance Plc'.

Table listing various unit trusts and insurance companies, including names like 'Legal & General (UK) - Contd', 'Liberty Life Assurance Co Ltd', and 'Lloyds Life Assurance'.

Table listing various insurance companies, including names like 'AA Friendly Society', 'Scottish Equitable Fund Mgmt Ltd', and 'Scottish Life Investments'.

Table listing various insurance companies, including names like 'City of Edinburgh Life Assurance', 'City of Westminster Assurance', and 'Equity & Law'.

Table listing various insurance companies, including names like 'Imperial Life (UK) Ltd', 'The LAS Group', and 'The Prudential Assurance Co Ltd'.

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INSURANCE, OVERSEAS & MONEY FUNDS

Table of insurance and overseas funds, including Scottish Mutual Assurance Society, Scottish Widows Group, and various international funds.

Table of insurance and overseas funds, including The English Trust Group, Equity & Law International Fund, and various international funds.

Table of insurance and overseas funds, including Hambros Bank Ltd, Management International Ltd, and various international funds.

Table of money funds, including Warburg Investment Manager, Warburg Fund, and various money market funds.

OFFSHORE AND OVERSEAS

Table of offshore and overseas funds, including Standard Life Assurance Company, Sun Alliance Insurance Group, and various international funds.

OPTIONS

Table of 3-month call rates for various options, including AIG, Allianz, and other financial institutions.

BRITISH FUNDS

Table of British Funds with columns for Name, Stock, Price, Last, Bid, Offer, and Yld. Includes sections for 'Shorts' (Lives up to Five Years), 'Five to Fifteen Years', and 'Over Fifteen Years'.

AMERICANS—Cont.

Table of American Stocks with columns for Name, Stock, Price, Last, Bid, Offer, and Yld. Includes sections for 'CANADIANS' and 'AMERICANS'.

LONDON SHARE SERVICE

BUILDING, TIMBER, ROADS—Cont.

Table of Building, Timber, and Roads stocks with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

ENGINEERING—Continued

Table of Engineering stocks with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

INDUSTRIALS—Continued

Table of Industrial stocks with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

INT. BANK AND SEAS GOVT STERLING ISSUES

Table of International Bank and Sea Government Sterling Issues with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

COMMONWEALTH & AFRICAN LOANS

Table of Commonwealth and African Loans with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

LOANS

Table of Loans with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

AMERICANS

Table of American Stocks with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

BANKS, HP & LEASING

Table of Banks, HP & Leasing stocks with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

BEERS, WINES & SPIRITS

Table of Beers, Wines & Spirits stocks with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

BUILDING, TIMBER, ROADS

Table of Building, Timber, and Roads stocks with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

CHEMICALS, PLASTICS

Table of Chemicals and Plastics stocks with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

DRAPERY AND STORES

Table of Drapery and Stores stocks with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

FOOD, GROCERIES, ETC.

Table of Food, Groceries, etc. stocks with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

HOTELS AND CATERERS

Table of Hotels and Caterers stocks with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

ENGINEERING

Table of Engineering stocks with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

INDUSTRIALS (Miscellaneous)

Table of Industrial (Miscellaneous) stocks with columns for Name, Stock, Price, Last, Bid, Offer, and Yld.

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INDUSTRIALS—Continued

Table of stock prices for various industrial companies, including columns for company name, price, and volume.

LEISURE—Continued

Table of stock prices for leisure-related companies, including columns for company name, price, and volume.

PROPERTY—Continued

Table of stock prices for property-related companies, including columns for company name, price, and volume.

INVESTMENT TRUSTS—Cont.

Table of stock prices for investment trusts, including columns for company name, price, and volume.

FINANCE, LAND—Cont.

Table of stock prices for finance and land-related companies, including columns for company name, price, and volume.

MINES—Continued

Table of stock prices for mining companies, including columns for company name, price, and volume.

INSURANCES

Table of stock prices for insurance companies, including columns for company name, price, and volume.

NEWSPAPERS, PUBLISHERS

Table of stock prices for newspaper and publishing companies, including columns for company name, price, and volume.

SHOES AND LEATHER

Table of stock prices for shoe and leather companies, including columns for company name, price, and volume.

TEXTILES

Table of stock prices for textile companies, including columns for company name, price, and volume.

OVERSEAS TRADERS

Table of stock prices for overseas trading companies, including columns for company name, price, and volume.

PLANTATIONS

Table of stock prices for plantation companies, including columns for company name, price, and volume.

LEISURE

Table of stock prices for leisure companies, including columns for company name, price, and volume.

PROPERTY

Table of stock prices for property companies, including columns for company name, price, and volume.

TRUSTS, FINANCE, LAND

Table of stock prices for trusts, finance, and land companies, including columns for company name, price, and volume.

FINANCE, LAND, Cont.

Table of stock prices for finance and land companies, including columns for company name, price, and volume.

MINES

Table of stock prices for mining companies, including columns for company name, price, and volume.

REGIONAL & IRISH STOCKS

Table of stock prices for regional and Irish stocks, including columns for company name, price, and volume.

NOTES: A section containing various notices, announcements, and legal information, including details about company shares and financial reporting.

REGIONAL & IRISH STOCKS: A section listing stock prices for various regional and Irish companies, including company names, prices, and volumes.

## TECHNOLOGY

## SGS ready to launch a Cad company

SGS, Italy's leading micro-electronics company, owned by the IRI-Stet state holding group, is this week planning to put the finishing touches to a new computer aided design company which will produce custom and semi-custom integrated circuits for the European market.

Although SGS already has three Cad centres in Italy and others in the UK, France, West Germany, Singapore and the US, the idea of the new company is to create a specialist business which will both design and manufacture prototype custom products. The SGS main manufacturing plant at Agrate, just outside of Milan, would produce the chips in quantity.

Mr Piero Martinotti, SGS vice president in charge of strategy and technology, said he expected the company to be operating by late spring and to achieve full capacity by the end of the year.

He said the goal was to achieve about US\$50m (€64m) turnover by 1990, of which about a quarter would come from Italy and the rest from other European markets.

The launch will put SGS in competition with big semiconductor groups such as Plessey, Ferranti, NEC and LSI Logic, the last having announced plans recently for a new plant in West Germany.

The new company, as yet unnamed, will be about 10 miles from Agrate. It will be given all SGS's basic semiconductor technology. Its main assets will be a computer aided design system and a product library containing a proven set of cells which can be combined to create custom circuits.

Mr Pasquale Fiorito, SGS managing director, said the company would achieve productive capacity for about 1,000 projects a year. Orders for custom products would be executed within three weeks, he said.

SGS is expected to start the company as a wholly owned subsidiary with 1,200m (£8.7m) of initial capital. Investments over the next five years should total about US\$50m (£35.6m).

ALAN FRIEDMAN IN MILAN

Geoffrey Charlish on a new lease of life for remotely operated tethered submerged vehicles

## Mine hunter blazes a trail into the deep

REMOTELY operated tethered submerged vehicles seem set for a new lease of life as engineers equip them with more power, versatility and intelligence.

A recent design from Fairey Hydraulics, for example, can be airfreighted to an operational area and be in action in an hour or two. In the US, experimental vehicles are becoming intelligent and able to "think" for themselves.

In the UK, the Royal Navy is taking increased interest and the Defence Ministry is expected soon to place orders worth over £10m. The craft will be used to hunt mines and retrieve torpedoes. The annual market is thought to be in excess of £100m.

Such vehicles, instrumental in locating the wreck of the Titanic last September, have gradually revolutionised subsea location techniques over the last decade. The art of working underwater at great depths, without risk to life and limb, has been greatly advanced.

Improvements in propulsion techniques, underwater navigation, robotics, sensing and communications technology have produced compact tethered craft that can dive deeper, see better, remain submerged longer and carry out more complicated tasks.

ROVs, as they are known, take power and navigational instructions from a mother ship via an umbilical cable and send information about their surroundings, from television cameras and sonar scanners, in the opposite direction.

No divers are needed, an important advantage in dangerous naval applications, and the craft have far greater endurance than manned mini-submarines where the crew normally has to be relieved after six to eight hours.

The ROV can stay submerged for days to search large sea-bed areas. Its endurance is limited only by the weather and the ability of the mother ship to stay on station.

Most of the impetus to develop the ROV has come from the offshore oil industry. Since the emergence of the first commercial craft in the early 1970s, many hundreds have been put into service.

Generally, basic vehicles have been offered without sensing or guidance systems, which have been added by the purchaser. Now, however, complete air-freightable systems, with vehicle control cabin and all the electronics, are appearing. One of the first is from Fairey in the UK. The main applications are inspection and maintenance of offshore platforms, submerged pipelines and cables, but the world's navies are now looking at ROVs. One of the first designs was used in the mid-60s by the US Navy to retrieve an atomic bomb from the Mediterranean.

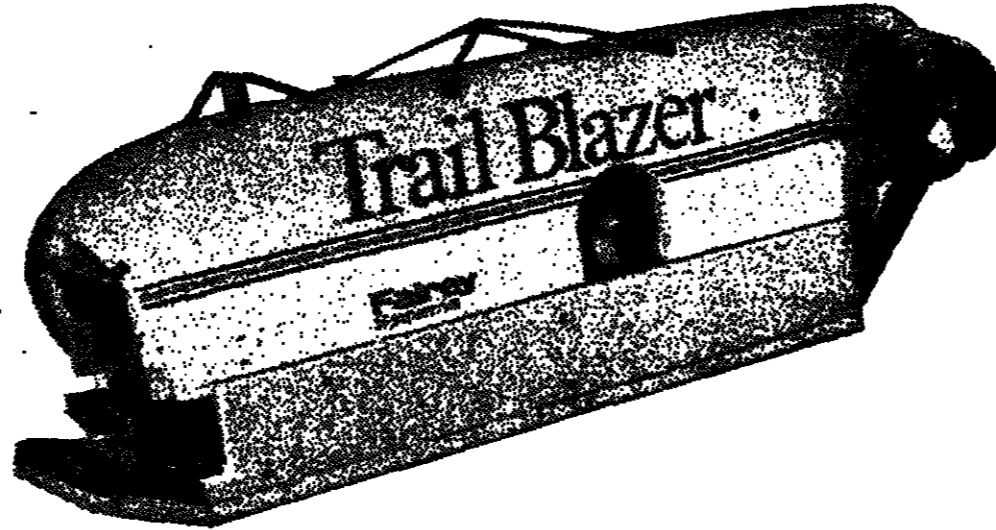
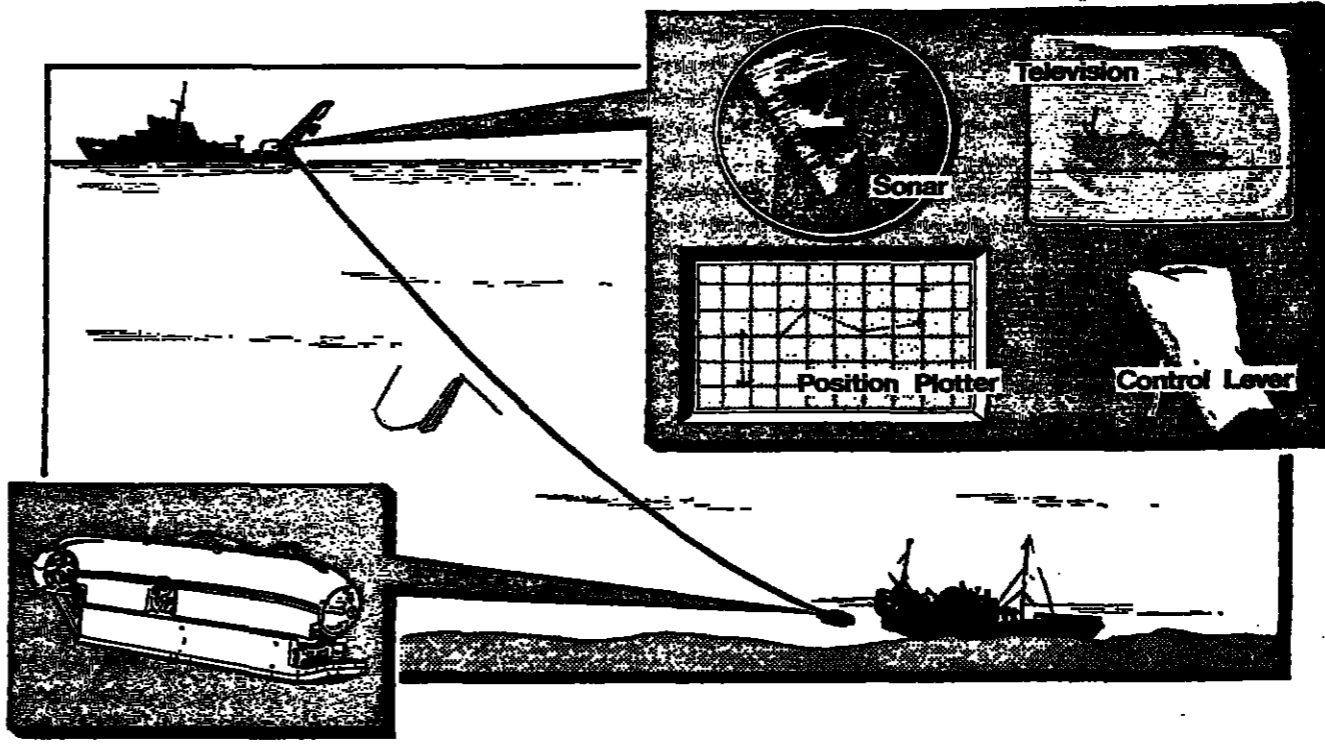
Fairey's latest craft, the Trail Blazer, is made in conjunction with International Submarine Engineering, of Canada, which has already sold 100 craft of previous models. Trail Blazer is specifically designed to naval requirements for mine counter measures (MCM).

A big headache for the world navies is the disposal of the latest mines which have become increasingly difficult to sweep conventionally. They can contain magnetic, acoustic and other forms of trigger mechanism and need visual appreciation by disposal officers before they can be dealt with.

Trail Blazer, capable of six knots on the surface, would go out in front of a minesweeper, use sonar (100 yards range) to locate the mine and then close in visually with a nose-mounted TV camera to place a disposal charge. The craft produces little

acoustic noise when "creeping up" and little magnetic disturbance since its hull is made from aluminium and the current down the umbilical (which produces a field) is kept to a minimum.

Manoeuvrability is important in such inspection roles, and the Fairey craft has five electro-hydraulic propellers, two at the stern for forward and backward motion, two amidships for sideways movement, and a fifth mounted below the midships for



## Design and Construct



## Move into process control

KLIPPON, an electrical component maker in Kent, has formed a company, Klippon HTE Microsystems, which will offer computerised process control equipment based on the Super Rexagan range developed by Imperial Chemical Industries.

The company says it has no intention of taking on the big process control companies such as Honeywell and Foxboro but will seek to fill the gap between large sophisticated systems and simple programmable logic controllers.

The company's first product, System Micro-4, offers considerable versatility at prices roughly between £5,000 and £25,000. It employs standard "building blocks" that can be fitted together in many ways to give a variety of control systems.

The central processing function is performed by a personal computer (IBM PC, Digital Q-Bus, Commodore, Toshiba) and the plant signals are converted by Super Rexagan into a form recognisable by the micro.

More on 0795 563222.

## Machine tool control system

HOSKYN, a computer services company, is to supply a computerised integrated manufacturing system to Victor Products, an industrial and mining equipment maker.

The £500,000 system will control machine tools in a flexible manufacturing cell made by Kearny and Trecker Marvin.

## WAKO SECURITIES NOW IN PARIS



Wako Securities is very pleased to announce the opening of a representative office in Paris. As one of Japan's top securities firms, we're now in an even better position to help our European clients with a full range of financial information, including venture capital and brokerage operations in Japan and Asia.

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The Patent Office

1986  
INDUSTRY YEAR



WORLD STOCK MARKETS

Indices

NEW YORK

Table of New York stock indices including Dow Jones, S&P 500, and various sector indices with columns for date, high, low, and change.

Table of international stock indices for Australia, Belgium, Denmark, France, Germany, Hong Kong, Italy, Japan, Norway, Singapore, South Africa, Spain, Sweden, Switzerland, and the U.S. Capital Int'l.

CANADA

TORONTO

Closing prices January 31

Table of Toronto stock closing prices for various companies like Alcan, Inco, and others.

Montreal

Closing prices January 31

Table of Montreal stock closing prices for various companies like Alcan, Inco, and others.

OVER-THE-COUNTER

Nasdaq national market, closing prices, January 31

Table of over-the-counter stock closing prices for various companies listed on the Nasdaq market.

NEW YORK ACTIVE STOCKS

Table of active stock prices in New York, including AT&T, Amgen, and other major stocks.

INTERNATIONAL ACTIVE STOCKS

Table of active stock prices in various international markets including Australia, Germany, Japan, and others.

AUSTRIA

Table of active stock prices in Austria.

AUSTRALIA

Table of active stock prices in Australia.

GERMANY

Table of active stock prices in Germany.

JAPAN

Table of active stock prices in Japan.

N. AMERICAN QUARTERLY RESULTS

Table showing quarterly financial results for various North American companies, including revenue, net profit, and earnings per share.

DENMARK

Table of active stock prices in Denmark.

HONG KONG

Table of active stock prices in Hong Kong.

NORWAY

Table of active stock prices in Norway.

NETHERLANDS

Table of active stock prices in the Netherlands.

ST. PAULI COG. Insurance

Table of financial results for St. Pauli Cog. Insurance.

FRANCE

Table of active stock prices in France.

NETHERLANDS

Table of active stock prices in the Netherlands.

SOUTH AFRICA

Table of active stock prices in South Africa.

SWEDEN

Table of active stock prices in Sweden.

FINANCIAL TIMES

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NYSE COMPOSITE CLOSING PRICES

AMEX COMPOSITE CLOSING PRICES

Closing prices January 31

Table of NYSE Composite Closing Prices for January 31, 1986. Columns include stock symbols, prices, and changes. Includes sub-sections for 'Continued from Page 34' and 'Over-the-Counter'.

Table of AMEX Composite Closing Prices for January 31, 1986. Columns include stock symbols, prices, and changes.

OVER-THE-COUNTER Nasdaq national market, closing prices, January 31

Table of Over-the-Counter (Nasdaq) national market closing prices for January 31, 1986. Columns include stock symbols, prices, and changes.

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Continued on Page 33

BASE LENDING RATES

Table listing various banks and their base lending rates, including ARN Bank, Allied Bank, American Express, etc.

CORRECTION NOTICE



The Kingdom of Belgium

Floating Rate Notes Due February, 2000. In accordance with the provisions of the Notes, notice is hereby given that interest payable on 28th February, 1986 will amount to U.S.\$10,389.32 per U.S.\$250,000 Note.

Interest rates applicable are as follows: 30th Aug. 1985 to 30th Sept. 1985 - 8 1/4%, 30th Sept. 1985 to 31st Oct. 1985 - 8 1/4%, 31st Oct. 1985 to 29th Nov. 1985 - 8 1/4%, 29th Nov. 1985 to 31st Dec. 1985 - 8 1/4%, 31st Dec. 1985 to 31st Jan. 1986 - 8 1/4%, 31st Jan. 1986 to 28th Feb. 1986 - 8 1/4%.

Agent Bank: Morgan Guaranty Trust Company of New York, London.

CURRENCIES, MONEY and CAPITAL MARKETS

FOREIGN EXCHANGES

A quandary over interest rates

BY COLIN MILLHAM

Starting moved back to the sidelines on the foreign exchanges last week, as the Government's problems over Westland were left to simmer, oil prices held reasonably steady, and the market awaited this week's Opec meeting and the latest UK money supply and bank lending figures. The pound consolidated around the \$1.60 level, and above DM 3.35, while the exchange rate index rose to 74.8 from 74.3.

Attention moved back to the dollar and the general weakness of the US currency, which is posing potential problems not only for the Reagan tax cuts but also for the government and central banks in Japan and Europe.

As expected the Bank of Japan cut its discount rate by 1/2 per cent to 4 1/2 per cent last week, but this had a minimal effect on the yen. German interest rates have not yet been cut, but a move may soon be forced on the Bundesbank for political as well as economic reasons.

At the recent Group of Five ministerial meeting in London there was pressure for a general reduction in interest rates among the leading industrial nations. Britain and France are not obvious candidates for rate cuts, but the market has not lost all hope that the Federal Reserve

£ IN NEW YORK

Table showing £ in New York exchange rates for Jan 31 and previous close.

The major beneficiary from the imbalance in US trade remains Japan, which accounted for about one-third of the US deficit. In contrast the Japanese trade surplus in December was a record \$9.6bn, and unless something is done to improve the situation the protectionist lobby in the US will grow increasingly vocal.

It is therefore a delicate balancing act deciding how soon and by how much the US discount rate can be cut to stimulate the economy and reverse the trade gap, while preventing the dollar going into free fall.

The movement out of the dollar has also attracted funds into the D-mark, and there may also be a cut for a cut in German interest rates, but it is generally felt the Bundesbank is more likely to reduce the rate on an expected securities repurchase agreement this week, rather than cut the discount or Lombard rates at Thursday's council meeting.

The franc has been manipulated to the top of the EMS, but there is still a fear that the strength of the D-mark could cause political embarrassment in Paris and Bonn by forcing a realignment of the EMS, involving a devaluation of the franc and the French elections in March.

POUND SPOT—FORWARD AGAINST POUND

Table showing Pound Spot and Forward rates against the Pound for Jan 31 and previous close.

DOLLAR SPOT—FORWARD AGAINST DOLLAR

Table showing Dollar Spot and Forward rates against the Dollar for Jan 31 and previous close.

CURRENCY RATES

Table showing various currency rates including Sterling, Canadian, Swiss, etc.

CURRENCY MOVEMENTS

Table showing currency movements for Jan 31, including Sterling, Canadian, Swiss, etc.

CURRENCY FUTURES

Table showing currency futures for Pound and Dollar.

CHICAGO

Table showing Chicago market data for US Treasury Bonds and US Treasury Bills.

U.S. TREASURY BONDS (CBT)

Table showing US Treasury Bonds data for various maturities.

U.S. TREASURY BILLS (HAM)

Table showing US Treasury Bills data for various maturities.

3-MONTH EURO-DOLLAR (EMM)

Table showing 3-month Euro-Dollar data for various maturities.

3-MONTH STERLING (SMM)

Table showing 3-month Sterling data for various maturities.

10% NATIONAL SHORT GILT

Table showing 10% National Short Gilt data for various maturities.

3-MONTH STERLING

Table showing 3-month Sterling data for various maturities.

OTHER CURRENCIES

Table showing other currency rates for various countries.

LIFFE—EURO-DOLLAR OPTIONS

Table showing Liffe Euro-Dollar Options data for various maturities.

LIFFE—STERLING OPTIONS

Table showing Liffe Sterling Options data for various maturities.

LIFFE—DEUTSCHE MARKS

Table showing Liffe Deutsche Marks data for various maturities.

LIFFE—YEN OPTIONS

Table showing Liffe Yen Options data for various maturities.

PHILADELPHIA SE 2 1/2% OPTIONS

Table showing Philadelphia SE 2 1/2% Options data for various maturities.

FTSE 100 INDEX

Table showing FTSE 100 Index data for various dates.

U.S. TREASURY BONDS

Table showing US Treasury Bonds data for various maturities.

EMS EUROPEAN CURRENCY UNIT RATES

Table showing EMS European Currency Unit Rates for various countries.

FORWARD RATES AGAINST STERLING

Table showing forward rates against Sterling for various currencies.

EXCHANGE CROSS RATES

Table showing exchange cross rates for various currencies.

EURO-CURRENCY INTEREST RATES

Table showing Euro-currency interest rates for various maturities.

NEW YORK

Table showing New York market data for various instruments.

BANK OF ENGLAND TREASURY BILL TENDER

Table showing Bank of England Treasury Bill Tender data for various maturities.

FT LONDON INTERBANK FIXING

Table showing FT London Interbank Fixing data for various maturities.

LONDON MONEY RATES

Table showing London Money Rates for various maturities.

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